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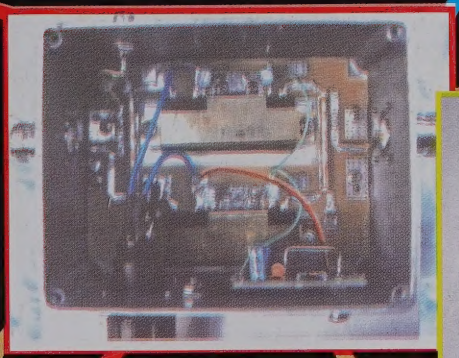

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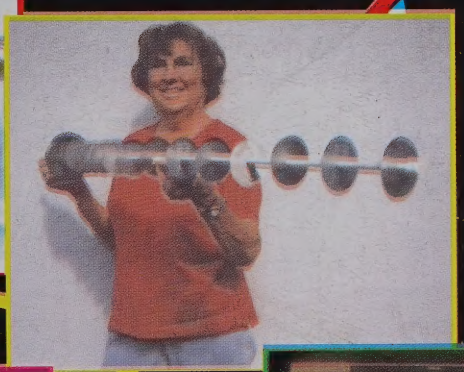

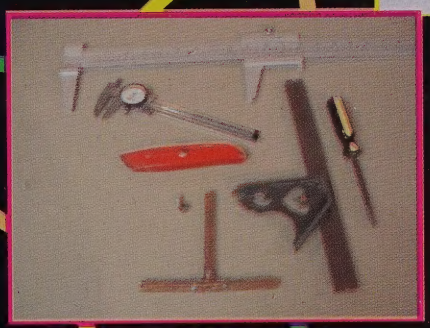

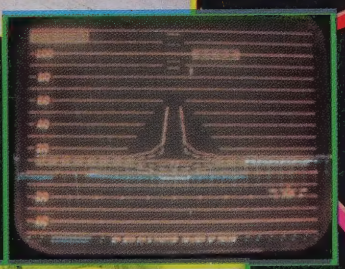

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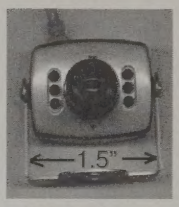

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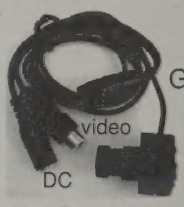

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Please send us your NEW ADDRESS! We pay 70 cents for each returned ATVQ. And we are usually nice and send another copy to your new address which costs us $1.29. Please help us from having to do this. Thanks!

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Amateur Television Quarterly
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Editors Notes

Wow, I had more to put in and ran out of room. Some of the things that I wanted to add or at least mention were:

Mark, KB9KHM, (**kb9khm@localline.com**) got his ATV repeater on the air in Lafayette, Indiana. I believe the output is 421.250 MHz.

Bob Bruninga, WB4APR, (APRS and satellite fame) started a thread on the Internet message groups (satellite and ATV) saying: "I'd like to form a core design group to design a **satellite Amateur TV repeater**. Everyone knows this won't work unless the satellite has lots of power (far beyond our usual power budgets).

But what if there was a launch opportunity that had 100 watts or more power available?"

I saved 47 emails that went back and forth that told why you could and why you could not do what he was suggesting. The neat part is all the interest it generated.

Even Miles Mann, WF1F, (ARISS) got involved saying:

"ATV, has been one of my pet projects for years, however, I never found a way to make it affordable. Or overcome some of the technical and legal issues. But lets get more people and do it."

And he went on to explain what he knows from being involved with ARISS.

And then James, KB7TBT, who announced: We have successfully implemented ATV over IP.

"I am a member of the Arizona Amateurs on TV group for over 13 years, I have unwillingly moved into a HOA, so I setup all my equipment at my friends house {KE7CDE}, we have constructed a controller that works off the serial line of our server for remote control of the transmitter.

We use a streaming program to send video to the server over the internet and in turn it sends it to the transmitter. The same program sends video back over the internet so it can be viewed from the repeater. We still have a few issues to work through but all in all it is up and running.."

For more information see: **http://www.kb7tbt.com**

So, thanks to all that provided information and articles for this issue. I hope you all enjoy ATVQ!

Gene - WB9MMM
ATVQ

ATVQ

Welcome to the Digital World V

By Henry Ruhwiedel - AA9XW Email: a9xw@cs.com
5317 W. 133rd Street
Crown Point, IN 46307

CONGRESS DEMANDS END OF ALL NTSC BROADCASTING APRIL 2008

ALL YOUR NTSC RECEIVERS ARE OBSOLETE AND WORTHLESS

DON'T BOTHER BUYING ANY MORE TV OR DVD/VCR'S

I am not making this stuff up. For nearly 2 decades astute readers of ATVQ have noticed that I began writing about digital TV, and if you are one of the fortunate you have a copy of ATV Secrets Vol II in which I explained the new DTV signals, and even gave some predictions of what was going to happen. You will find it 100% correct. The end is neigh.

Depending on which version gets passed as law, the date could be April 1st to April 15th of 2008 or some day in between. Choose the joke on the American public or the Tax reaper day, either one is a favorite with congress, so they will compromise and pick one in between. It was going to be New Year's Day, but since few in congress would be sober enough to remember to turn off the transmitters just as the Times Square ball strikes midnight, being a cruel hoax on too many people, and besides, congressmen didn't want a few million drunks calling them at home to complain the TV set went dark. No, the new date is in April, a fitting month when many of them are already on spring recess to go watch TV in countries that are not abandoning their analog TV systems. It's all for the sake of money. The TV channels will be sold to the highest bidder so congress has more money to waste (spend) on some other worthless projects.

D day is quickly approaching. As of right now, 99% of the USA is able to receive at least one digital-over-the air TV signal, and nearly 90% can receive three or more. Any alien planet with its own SETI project better look quick, because Earth will no longer be sending out any visual signals except the 80% of the world not part of the USA. Yeah, a few tiny countries with transmitters smaller than your ham rig have gone DTV, but so far the vast majority of the world will still be analog. But D-day is just a return to Morse Code, but with a bigger character set! Let's hope the UHF bands are open so we can all DX the last moments of NTSC transmissions as they wink out across the country. Just think of all the megawatts saved in electric consumption as 1800 50-220 KW transmitters all go THUNK in the night together. Lets also hope that by then there will be battery powered digital TV sets, because when your power goes out, what are you gonna watch? No, your digital video phone won't work either, pay attention to the Katrina example, no power, no phone, no radio, no TV unless it runs on batteries. So far, not one DTV TV set is small enough to run on a battery. Your cell phone doesn't count because it will be getting its video from a bunch of channel 55 transmitters, and their generators will run out of fuel, and with no phone, no remote control, except those fed by FO (fiber optic). So keep your ham gear in good shape, you may be the only watchable TV station in town!

OK, no one will throw out their NTSC TV sets. Congress might give you two $50 certificates to help buy a set top box DTV to NTSC converter. Then again, the IRS might also consider that $100 income. Congress never gives us something for nothing, even when it's our own money. How many of you pay taxes on your Social Security income?

Actually many TV stations are still analog. Many will remain as analog TV stations. They simply convert the analog signal to digital format to transmit it in data form. At the receive end, we simply grab the data and reorganize it to make analog again. And if you look at the RF signal, it also is analog. Come to think of it, there is very little digital in digital TV. Every speaker, camera, video display, microphone (ie transducers) is analog, and logarithmic. Even eyes and ears and log based. (And you thought logging was only and FCC or QSL requirement!)

Hey, how's your blue screen? Digital will mean the end of snow, unless you live in Minneapolis, Fargo or such. As you may have heard, there is the cliff effect. The cliff effect is like this: You walk up to the grand canyon, admire the view, "Hey this is perfect" you inch closer to the edge, still a perfect view, you tip toe to the very edge where the gravel begins to slip out from under your feet into the abyss, "hey the view is fantastic." Now take one step forward. Check out the blue screen above. You may get a few spectacular views on the way down, but your perfect view is now a jumble of flashing scenes (perhaps of your past life) and the perfect view will not return. Bump, Thud, Ouch, silence. You just went beyond the cliff edge.

Likewise there is only 1 dB between perfect picture and sound, and no picture or sound. So 1 dB may mean the difference between being able to watch TV or not. But you may need more for some other reason. Remembering back to the glory days of analog TV, we had a few issues with pesky QRN and QRM known as noise and co-channel, and Casper our friendly ghost,

always hung around the rabbit ears. Unlike the French, we figured that noise would be less objectionable if Aunt Martha's hair dryer sparks were confined to her hair and not the electric lines, but we inverted the video to make it less visible. We also used FM and not AM audio which Major Armstrong showed was noise free. But we needed about 34 dB carrier to noise ratio in order to have a picture that was considered watchable (slightly annoying, but not as much as Rosanne Barr). If we remember back to the days of yorn, you might remember -174 dBu as the limit of reception of a 1 hertz wide signal, and about -106.2 dBu for a six MHz wide signal. (for the math inclined Vn2 = 4 kTR df. K= 1/37x10-23 Joules, T= 290 K, and kT = 3.973x10-21 watt-sec. Or our simple Log friend: double the bandwidth and you double the noise POWER (3 dB). Footnote: 44 dB C/N is considered the threshold of perception of noise in a picture, thus VHS, etc. was all engineered to offer about 44 dB C/N ratio. Whereas the best we had in broadcast was 62-64 dB from those hunky quad machines. 24 dB C/N is still watchable, but considered as annoying as in-laws that won't leave after the holidays. (P3 in our ham TV terms). Now this should sharpen a few minds to build some narrow bandwidth video filters to get down to 1.5 MHz bandwidth, a 6 dB gain in C/N ratio or 750 KHz for 9 dB improvement. That's better than going from 1 to 4 beams in a quad array and a lot less work and money!

In DTV, the C/N ratio need be only 15 dB, actually 14.7, because the signal can be very noisy and still be decoded. That means I can use 10 dB less power (From 5 million to 500 KW ERP) and get the same C/N ratio. (noise is Voltage - 20 Log, power is Watts - 10 Log). Our DTV signal is also NOISE LIKE. Not Sinusoidal. The DTV signal has a flat spectrum, so any constant carrier is easily seen and removed. The DTV signal is also encoded at several levels to make it more robust.

The CW buffs will be happy to read that CW (Morse Code) is a very robust signal. Why? Because it has such a narrow bandwidth the noise can be filtered out in any number of ways including a digital signal processor (DSP) which can reach the theoretical 1 Hz bandwidth of filtering. There is also a time value to the signal If we know the average speed of the transmission i.e. 20 wpm, we can clock our receiver gate to accept only impulses that are time coincident with a 20 wpm signal. That eliminates all the time variable (non coherent) noise, and we only look for an impulse when we expect an impulse. DTV does that with a precise symbol rate. In CW if we miss a letter or two, we can "read between the letters" and fill in the likely word. Think Wheel of Fortune or a cross word puzzle. That is an example of error correction. In CW we can also send "send again" or "words twice" a simple example of forward error correction FEC. In DTV we do it by using a coding scheme that includes extra symbols, typically ¾ FEC. But what really helps is a deeper layer of coding. If a noise burst wipes out an entire CW word or two, its gone. But in DTV, the message is scattered into blocks. If our original MPEG digital message was AAAABBBBCCCCDDDD, it will be sent as ABCDABCD-ABCDABCD. Now if two or three characters are missing, ABCDAB ABC CDABCD, we know what to use to fill in the holes. We then code it back to AAAABBBBCCCCDDDD and we have our message with no errors. It's the same process that allows us to read what looks like gibberish. If the first and last letters of a word are in the right place, the rest of the letters can be in any order and we can still read it easily. If the frist and lsat ltteers if a wrod are in the rghit pclae the rset of the ltteers can be in any oderr and we can still raed it elisay. How aoubt taht!

The next improvement in decoding the signal is an amplitude slicer. In analog, there are no discrete signal levels, it's a continuous waveform. In DTV, we know the signal must occur at a certain time (symbol rate) and at a certain level (1 of 8 possible voltages). So if we slice the signal by level, we begin to eliminate the noise amplitudes (just like FM) and only look for impulses at the clock rate, and any impulse is divided into one of 8 possible levels. The error rate is a maximum of 50%, since any impulse must be decoded to the nearest N level, and so any bit has an absolute error of being 1 level off. Thus any impulse 0 to .5 = 0 and 0 to -.5 = 0. .50000000000001 becomes 1, up to 1.5, etc. Thus we have 4 positive levels, and 4 negative levels providing 8 bits. Think of it as a very noisy slow scan grey scale we used to send. In analog SSTV we had noisy grey, in digital SSTV, the noise was reduced and we had a nicer gray level, until the big gun DX'er opened up his mic processor 2 KHz away. So we began to add variable passband tuning and other stuff. Likewise, DTV.

Equalization in DTV is the use of a delay line with lots of taps along the way. Think back to the old bucket brigade devices we used for SSTV. If there is a signal we don't want that exists at a fixed time interval from what we do want, we can time shift the "noise" to get it out of the way. We can also time shift a ghost signal, invert it and add it back to cancel the ghost. While our data is going down the delay line, if we add a tap at every time interval that equals the inverse of the symbol rate, (1/R=T) if there is a level or phase error at Tn we can detect it and then correct it. Early DTV sets had a short delay line, only a few microseconds. The latest "Generation 5" have a delay line that is

more than one horizontal video line long. That is long enough to detect and cancel any early or late ghost signal.

But there is a cost to all the error correction. Noise adds to the noise floor, and ghosts cause amplitude errors that then require correction, that decreases the C/N ratio. So if you have a ghost signal, or noise, you won't see it, but it will increase the required signal level from that magic 14.7 dB C/N to some higher number, perhaps 20 dB C/N. The problem for the home viewer is there is no information provided by the TV set that tells you if the blue screen is being caused by lack of signal (below 14 dB C/N ratio) noise or ghosts.

What to do?

ANALOG TV to the rescue. While ANALOG TV stations are still on the air, you can use your current TV set to peak up your antenna system. Antenna aim is much more critical in DTV than NTSC. So while the snow is still on the roof, and the hurricanes are saving up for next summer, invest in a good outdoor TV antenna. You may want to get a rotor too, because if all the DTV stations are not on the same transmitter tower farm, or if you can get more than one market (DMA) you will need the rotor to get the best C/N ratio. In any event, you will want to make sure you have a good signal now, while you can still see one!

If you already have a DTV TV set (ATSC compliant) or one of the cheap set top boxes (Samsung seems to work best) you may already have noticed the need to aim right. As for what TV antenna to buy, most DTV stations are on UHF, a fair amount on high VHF, and a few will remain on low VHF (2-6). Keep in mind that stations will identify with their old analog channel designations (seems stupid to me) even though few will actually be on their analog channels with DTV. In Chicago, Channel 11N is channel 47D, and channel 2N is now 3D, but will be 11D when 11N goes away. And when all the full power stations turn off their analog channels, then the low power, booster and translator channels will jump around to find a new digital channel (sometime in 2007-2008). If all goes well, by 2010 the FCC will have collected all its auction monies, given it to congress, who will give up to $900 million back to us in the form of coupons for a $50 discount on a $100 box so we can watch DTV on our analog TV sets. What congress plans to do with the billions is anybody's guess, but for certain, they will find a way to spend it. Maybe they can improve the IQ of TSA and FEMA workers .... Naw, the world still needs burger flippers.

ATVQ

DTV Transisition - From The News

Differences between House Democrats and Republicans over funding of a DTV converter box subsidy could delay setting a hard date for analog switch-off of over-the-air TV service, according to Rep. Ed Markey (D-MA).

During a C-SPAN interview Dec. 4, Markey said a delay of the hard date from Dec. 31, 2008, is easy to envision given the disagreement over the digital-to-analog converter subsidy plan.

The Senate has already settled on a generous program that would subsidize the purchase of converters with $3 billion set aside from the proceeds of auctioning off spectrum currently used for analog TV transmission. The House version is much more restrictive, setting aside about $960 million and requiring consumers purchasing converters to apply for a rebate.

Markey and Rep John Dingell (D-MI), who sit on the House Energy and Commerce Committee, are leaders in the party's push for a more generous subsidy. Markey envisions consumer anger over the shut-off of analog service without a program that is big enough for all over-the-air viewers. The Senate version of the DTV legislation calls for an April 7, 2009, cessation of analog transmission. The differences between House and Senate versions are expected to be reconciled in a conference committee. However, Markey's comments throw into question the ultimate deadline.

House Moves for All-Digital TV by 2009

House lawmakers approved legislation early Monday that would complete the transition to all-digital television broadcasts by Feb. 17, 2009.

The measure also would allocate up to $1.5 billion to help consumers with older, analog TV sets purchase converter boxes so they would continue to get service in the digital era.

The Feb. 17th deadline - the so-called ``hard date'' to end traditional analog transmissions - was a compromise between House and Senate legislation that called for different end dates.

The House initially proposed ending analog transmissions on Dec. 31, 2008; the Senate had backed a hard date of April 7, 2009 - after the March Madness college basketball playoffs.

The Senate had also proposed a much bigger converter box subsidy of $3 billion. The compromise figure of $1.5 billion is meant to help the 21 million households who rely on free, over-the-air television. Cable and satellite customers would not be affected by the switch to digital.

The new House bill would initially provide up to $990 million for the converter box subsidy, including about $100 million for administrative costs. If more funds are needed, another $500 million would be made available.

The move to all-digital will free valuable radio spectrum, some of which will be allocated to improve radio communications among fire and police departments and other first responders. The rest of the spectrum would be auctioned by the government for an estimated $10 billion, though private estimates put that number higher.

The House bill also would set aside up to $1 billion for public safety agencies to upgrade their communications systems.

ATVQ

ATV Contest Correction

One entry in the ATV contest should have not been included with the others as it was Mobile, which is a category by itself. Even though I knew it was mobile, it just did not sink in when I was doing the write-up. I apologize to Shannon, KC9BIE, as she put all the effort into doing ATV mobile and did not get recognized.

So, Shannon was First in the Mobile division and a certificate recognizing that has been sent. And, she did it by getting almost 6000 points! That without living on a mountain, having a 100 foot tower, and not having a KW of power. What she did have I'll bet was a lot of lonely hours in the vehicle waiting for the contacts!

Catagory - Mobile

Rank	CALL	MILES	POINTS
1	KC9BIE	2591	5902

Catagory - Home

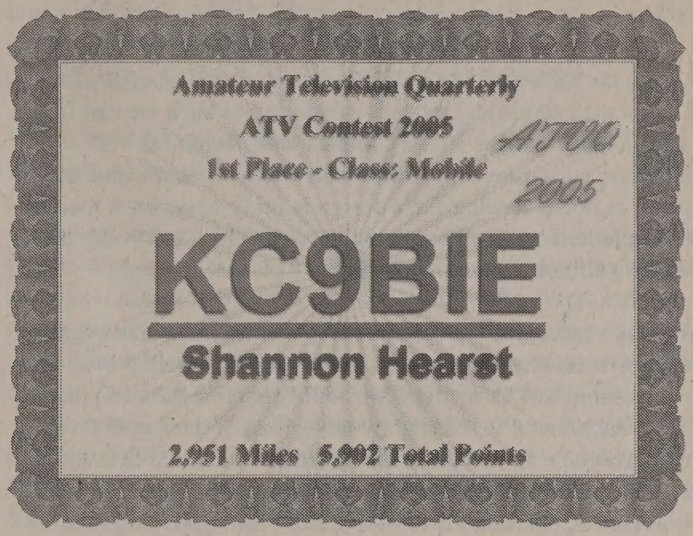
Rank	CALL	MILES	POINTS
1	N9XHU	8477	16954
2	KA9UVY	7580	16948
3	KB9LII	6661	13322
4	WB8ELK	6551	13102
5	K9SM	5745	12708
6	WA9IZV	6008	12016
7	KA9EGM	4698	9396
8	AA9MY	4114	8228
9	WU8O	3396	6856
10	NR8TV	2585	5170
11	KO0Z	2152	4480
12	K0PFX	1590	3180
13	W9TZB	1463	2926

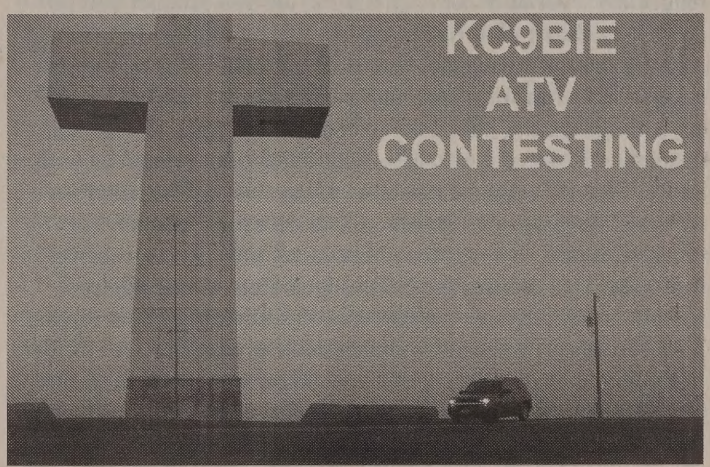
The attached chart shows the re-order of the Home category as well.

Next year will she have competition in the Mobile category? Guess we will have to wait and find out.

Congratulations Shannon!

ATVQ





KC9BIE on Bald Knob recieved in Centralia, Illinois by KA9EGM - 67 miles!

Digital TV Is A Lot Of Noise

By Henry Ruhwiedel - AA9XW Email: a9xw@cs.com
5317 W. 133rd Street
Crown Point, IN 46307

We are not talking about the RAP music awards here. Analog TV is a nice sinusoidal related waveform. As such we can filter, measure, and analyze it as a complex sine wave. DTV is impulses, noise like, and we can only filter, measure, and analyze it as noise. Analog filter design is fairly easy, since there is little splatter generated by an undistorted sine wave. A digital signal is all noise!

We make square waves by distorting sine waves which creates harmonics and IM products by adding and subtracting even and odd harmonics. The relationship of IM (intermodulation) distortion is such that it is reduced by the square of the signal level. In the receiver, IM products are generated when the first active device is saturated and becomes non linear. The mix effect then combines signal A and B to produce the IM signal C. If we reduce the level of either A or B by 2, the TM product will go down by a factor of 4. So the easiest way to reduce IM is to use a pad to reduce high signal levels. In our ham TV receivers, we have a very wide front end, and we can get IM interference by any strong signal within the passband of the input. We can eliminate the QRM that is outside of our bandwidth of interest with an RF filter. A 2nd good reason to always use a VSB filter for ATV, not only does it eliminate the unnecessary sideband on transmit, it also removes the unnecessary noise at our receiver front end. This reduces the IM products from strong adjacent signals as well. Since low power (100 watts or less) interdigital filters are cheap and easy to build (see many articles in ATVQ, VHF Communications, CQ-TV etc). We can make as many as we need for the ATV frequencies of interest, and they become a DX enhancement device since they reduce the noise bandwidth of our receivers. But a noise like signal has an infinite IM product ability, so what do we do?

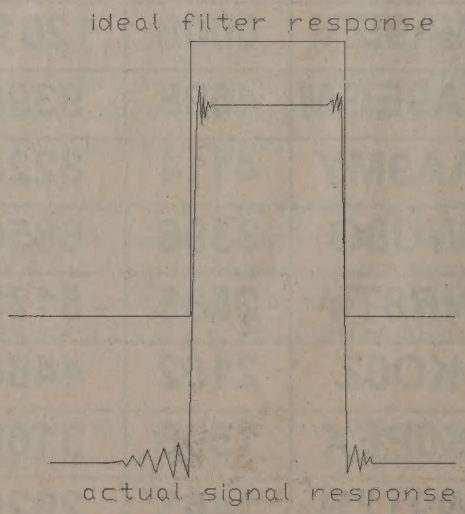
First we transmit a symbol rate that places the IM products on the same frequencies but out of phase so they cancel out the undesired signals in modulation. Next we introduce a quadrature modulation so the information we want is on the I carrier and the Q carrier carries nothing except the residual IM, which we toss away at the receiver. Now we have a vestigial sideband digital signal (or 8VSB since DTV is 8 discrete signals).

Assuming we have a mast mounted preamp, the noise floor at the receiver terminals is already above the receiver noise floor, so the 1 dB or less insertion loss is of no consequence, except that also reduces any IM products in the receiver. We only need enough gain to overcome cable losses, any additional gain is simply adding more noise to our receiver mixer stage, and noise is the enemy in analog.

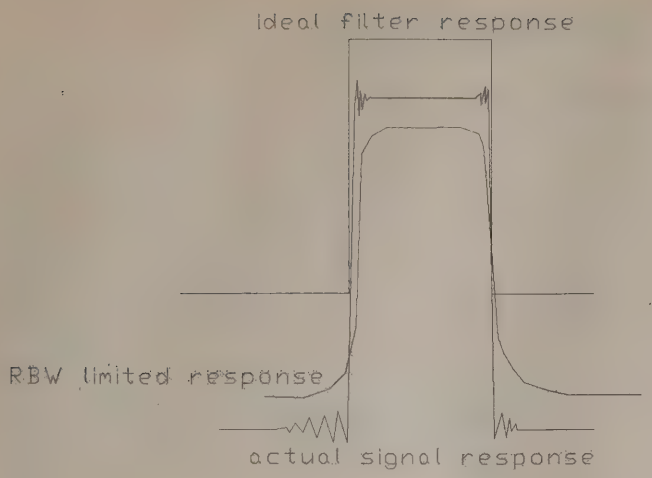
But Digital TV is a noise like signal. Thus we can use all our expectations of noise to analyze and decode the signal. There is Gaussian noise (random galactic noise) and coherent noise. DTV is coherent noise. It has specific points in time where it will occur and when it will not occur. But noise is also an impulse. Filter designs for impulse waveforms are more complex than analog filters. Most of us should be familiar with the filter ringing effect on signals. If you ever used a narrow CW filter you heard the audible "echo" on the beat frequency. The problem is caused when the filter is too narrow and introduces distortion.

All impulses have "infinite" sidebands. The FCC says any digital signal has sideband products from DC to light. (go read the regs) As such any digital signal must be filtered. Any filter will also introduce ringing, so we want to reduce both the splatter (dc to light) and things that go bump in the spectrum analyzer at the edges of our filter response.

The proverbial brick wall filter can never be achieved, simply because we cannot design a physical filter that achieves 1 Hz bandwidth. But we can devise an electronic filter that approximates the ideal filter. As our diagram illustrates the ideal filter response and what we get if we put in an impulse signal. This is called impulse filter response. Oddly enough it is the same with digital signals since they are noise like (series of impulses). Note that the ringing starts before the pulse actually starts. The math guys stay awake nights explaining how something can happen before it happens, but it does.



Filter response



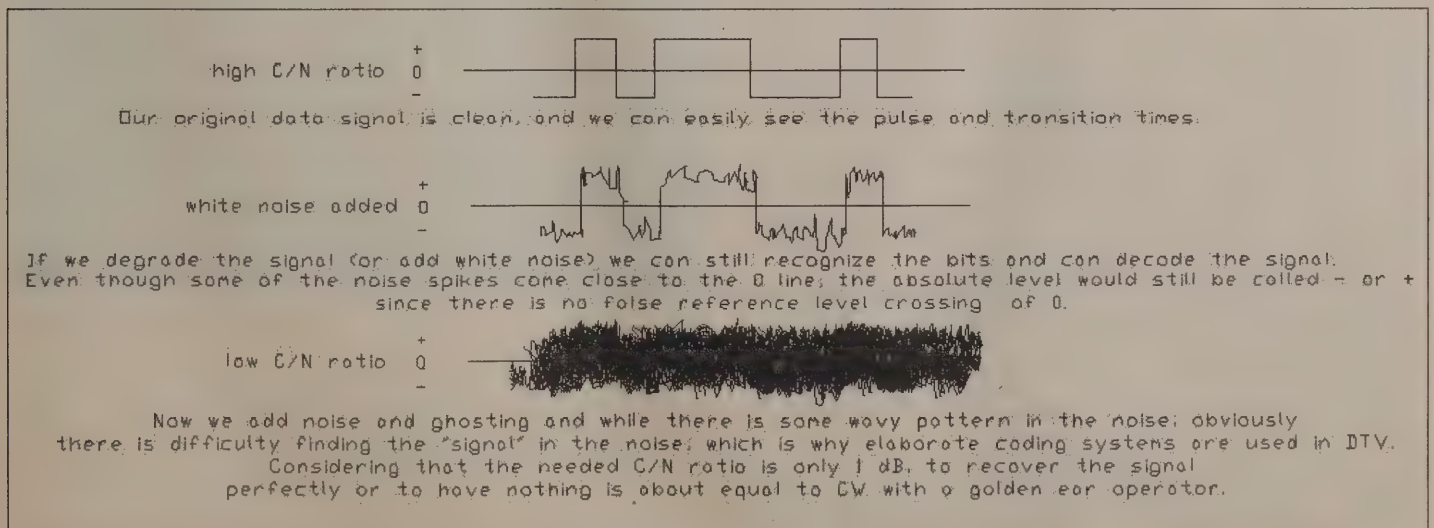
Filter Response + RBW

Now some of you have a fancy spectrum analyzer to measure the filter response. But if you don't understand what it is saying, it is lying to you. The SA has a filter that is swept across the frequency span of interest. The filter in the SA has a resolution bandwidth (RBW). We can get the most accurate measurement if we use a 1 Hz RBW, but it will take a long time to sweep the filter, or we can use a higher RBW and a faster sweep, but the result is less accurate. (You never get something for nothing). On older analog spectrum analyzers, the lowest filter was often 10 KHz. That means the entire power across 10 KHz is displayed as the total amplitude, not the actual amplitude. If we narrow the RBW down to 1 Hz (as some digital SA's can do) we can actually see the Hz by Hz response of the filter. So the SA response is more like the smoothed curve in our diagram, and does not show the actual filter response or the impulse waveform since the RBW has the effect of smoothing the ringing into an additive equivalent level.

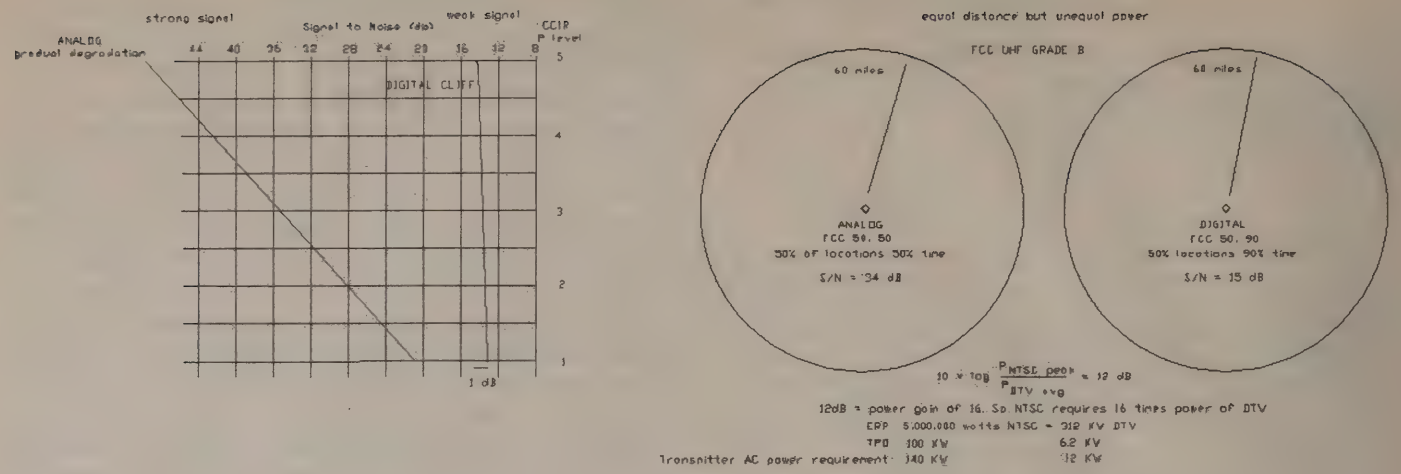
In digital TV, a similar function is done to achieve the equivalent power by measuring the total of all energy in a series of 1/2 MHz wide bands across the entire 6 MHz. We correct the actual display by the ratio of the bandwidth measured to a 5 MHz bandwidth. This is because the .5 MHz on each side of a DTV signal is already being reduced by the filtering, and only the central 5 MHz bandwidth are at full power. (BW/RBW). The typical in line power meter does not read actual power. It reads voltage and the bandwidth is at least an octave wide, so it is reading all the power in the coax, including all out of band energy from any source. The VSWR meter also does not compensate for generator mismatch, only termination mismatch. The VSWR meter is fairly good at reading sinusoidal signals, since the peak to average ratio is known. (CW). But the peak to average ratio of noise can only be approximated in a probability curve.

We are measuring the "noise power" of the desired "noise" to the noise power of the undesired noise.

While this may be a little round about, we need to know that transmitting a CW like signal (sinusoidal modulation) is not the same as a digital (noise like impulse signal). The filter response requirements are different, and power measurement is not the same. Our typical in line watt meter is a low frequency response device. The peak to average ratio is not evident on the watt meter since it is average responding, and has a very long time constant (compared to the modulation frequency). A peak reading meter will not read properly, since it will respond to the highest peak in a time period, not the average power over time. If the peak is 16 dB above the average the common VSWR meter in average or peak mode will not read the actual power. Think of a radar transmitter sending out a 50 KW peak signal, with a 1 microsecond duty cycle and a 10 watt final. Likewise the spectrum analyzer is limited by the RBW to reading the power within a certain bandwidth. With the SA, we can add a correction factor (in dB) to the indicated value to correct for the RBW. In the VSWR meter, we have no clue as to the RBW so it is pure guesswork what the actual power level is. To truly measure DTV (which is noise) we need an absorption type power meter. A sample of the RF is taken through a calibrated sensor (slug in our parlance) so that the actual sample is 1 watt or less which is the limit of most inexpensive meters and a lot of very expensive test gear. Usually noted as +30dBm. However, to avoid having a peak in excess of the units crash and burn level,



C/N Comparrison



NTSC vs DTV power

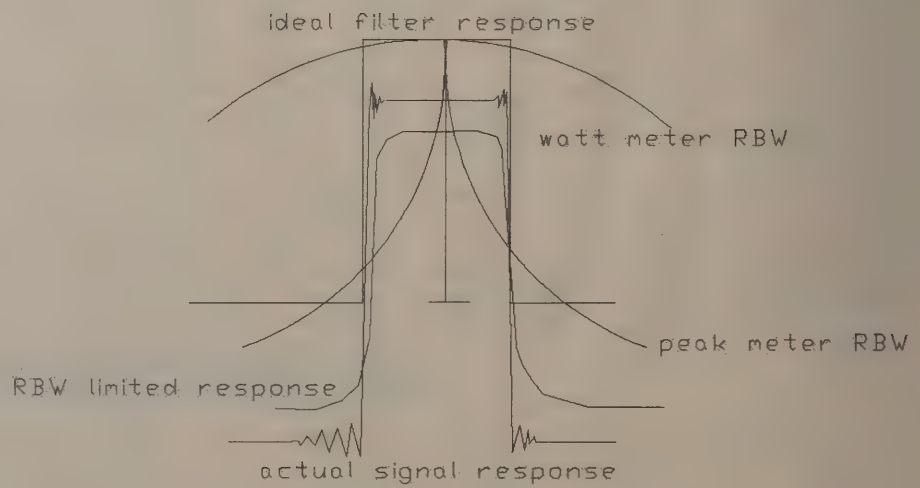
you never want to attach a signal having a level 6 dB less than the limit. The safest way is to always use a 6-10 dB pad on the input. On lower power exciters, we can simply pad the output to below 1/4 watt, to be safe. That also insures we are below the input overload (IM) intercept point.

The input pad also greatly reduces the effects of any mismatch in the system. So if there is a bad VSWR, the additive voltage will not exceed the input voltage limit, even if the power level is not exceeded. The tap point will always have constant power, but not constant voltage since the voltage at any power is a function of the impedance at the tap point. VSWR is a change in impedance, thus a change in voltage, but the phase may be anywhere from -90 to +90 degrees to the incident wave, (thus standing wave RATIO) but when the voltage changes, the current also changes because the power has not changed. If you were to make a slit in your coax and slide the probe along the length, you would see the voltage nodes and antinodes that indicate the ratio of incident to reflected waves. However the power is constant the entire length (minus any resistive component).

In a digital signal, the VSWR is the same as a ghost reflection. It amounts to phase error in the pulse signal just as a visible ghost is a reflection component in analog video. The advantage of digital TV is that a ghost 1 dB below the desired signal would be severely annoying, while the digital signal can be phase shifted in the delay line equalizer to completely cancel the ghost. The latest devices can even deal with a 0 dB ghost (equal amplitude).

If we look at the last diagram, we are trying to measure the digital signal power. The signal power is everything inside the ideal filter rectangle. The top curve represents the RBW of a typical VSWR meter. It is looking for the average power across its entire bandwidth. Depending on the selectivity/sensitivity curve of the sensor, it is going to simply diode detect all the power it can find which may cover an octave or more (400-800 MHz) within its stated range, plus several octaves more at reduced sensitivity (50 MHz to 2.5 GHz). The only way to even get close is to use a channel filter with a bandwidth about 2X the bandwidth of the signal. The peak meter will try to sample the highest signal (the curved peak) within its passband, again, easily an octave or more. So not only will the meter read the desired signal power, but likely harmonics and IM products since it doesn't have any frequency discrimination. If we try and calculate the power, (amplitude x time) we can figure out the power in the passband. That is what a modern spectrum analyzer does, and may already include the fudge factor to compensate for the RBW being used. So that is how we measure DTV, as noise power.

ATVQ



Filter Response + Power

Midwest ATV DX Report

By: Bob Delaney - KA9UVY - Email KA9UVY@hotmail.com
10630 N. Delaney Lane
Mt. Vernon, IL 62864
DX Hotline 618-242-7063

DX Reports:

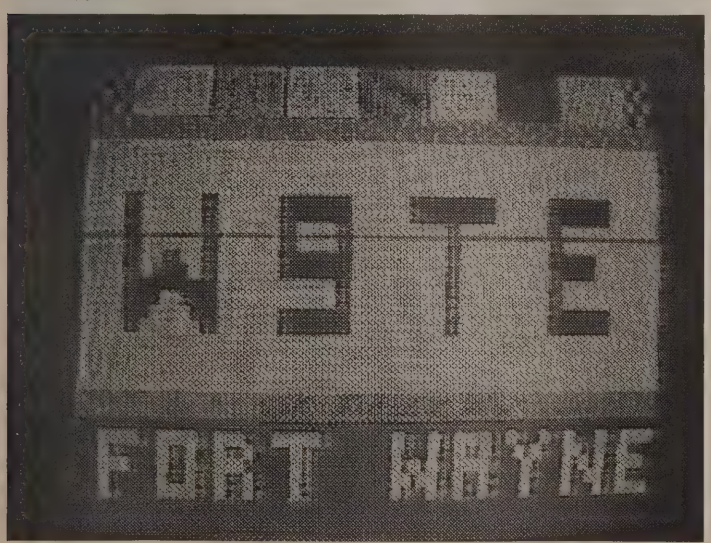
09/21/05
01:26z KA9UVY EM58ng IL worked KC0HFL EM17io Kansas with P-1 signals our second video exchange at 469 miles!

09/21/05
01:49z KC0HFL EM17io KS worked KD0LO in Wildwood, MO with P-2 signals. KD0LO reports that this is his first Kansas video contact at 365 miles.

10/12/05
01:08z KC8LMI in Michigan reports working N9LLR in Wisconsin with P-2 signal levels at 180 miles

Bryan, KC8LMI in Michigan, also reports that since installing the pair of 45 element 900 Mhz antennas at his QTH that the W9TE repeater from Fort Wayne, Indiana has been seen several times there.

Bryan also works 900 Mhz mobile and sent along this picture taken from about 26 miles out while mobile to the Fort Wayne Hamfest.



He also reports getting a lot of stares from passing motorist on the way, check out the rack on this SUV.

I'm sure all of the Deer Hunters were green with envy!

PLEASE SEND IN YOUR DX REPORTS!

Summary, DXing News

As expected not many reports this time and we are into the toughest part of the DXing season so next column will probably be a bit thin as well. Now is the time to make plans for next year and get those shacks and all of the gear in order so you are ready to run when the bands open up.

Now the Big NEWS:

DIRECTIVE SYSTEMS IMPROVES THE DSFO-25 !

Dave Olean of Directive Systems has tweaked the element lengths on the 25 element ATV yagi to improve the swr match for the high end of the band. The DSFO-25ATV has always been a great performer but in covering the whole ATV band had a little higher swr on 439.250 MHz than most of us liked. I explained to Dave that even when working repeaters (inband) most ATV is transmitted on 434.00 or 439.250. Most DX work is on the highest end at 439.250 MHz and only the repeaters, usually omni, transmit at the low end 421.250 or 426.250 MHz.

Dave listened and more importantly acted on the information and now a perfect match at 439.250 is easily obtained with this yagi. It still will give a great swr on 432.100 and below but

Dave recommends that if you're operating on the low end of the band that you should purchase the SSB version of the yagi. Not the ATV version since the gain now rolls off a little below 430 Mhz.

Dave also was so happy with the results that all DSFO-25ATV's made from here forward will be of the "new and improved" design. You can purchase element kits to rework your old FO-25's from the factory if you want to upgrade them. Contact the factory for details and check out the information on the upgrade at: **http://www.directivesystems.com/DSFO25-ATV.htm**

You can also check out the swr curve of the improved design and see the notes on adjusting the T-match etc.

DX Tip:

Well with all of the news on the DSFO-25 I thought I might pass along a construction tip rather than an operating tip. Building UHF yagis of this type can be a frustrating and lengthy endevour especially to a first time builder.

The centering and locking of the elements into place can be, and is, a real pain. There may be better ways of doing this but this is what I found helped while upgrading my four DSFO-25ATV's to the new design. Here are the tools that can make this job go a lot smoother (Fig 1).

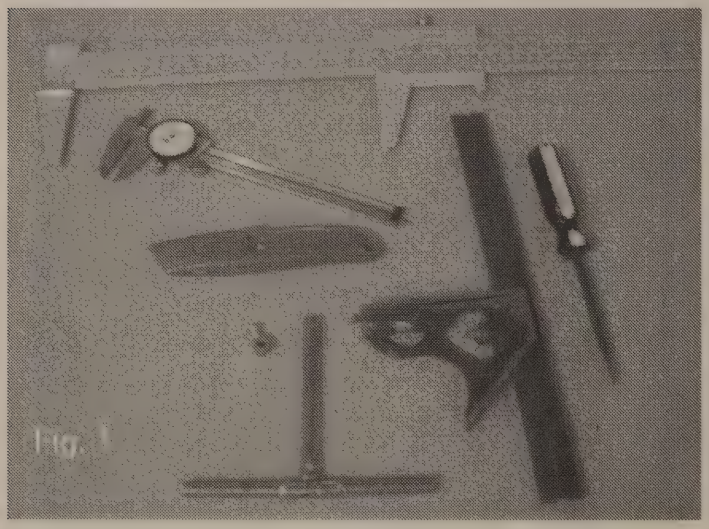
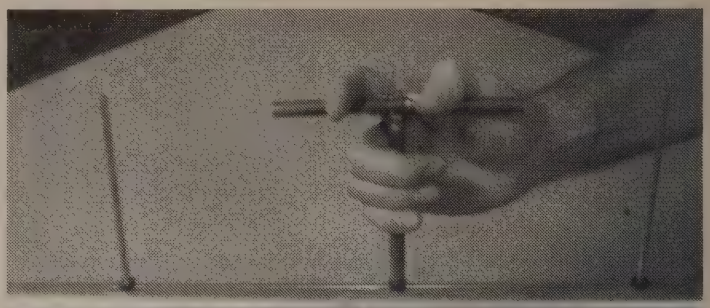


Fig. 1

I use the sliding square technique for centering the elements and if you are building more than one of these yagis once you get the first one right the others will take a lot less time. You can simply adjust the square for the element half length of the finished yagi and the element can be positioned on the next yagi (first time). I verified the element center with the 6" dial caliper but the sliding square should get you within the 1 mm error as specified by the manufacturer.

The tricky part of course is holding the element still while installing those little keepers. To help aid in doing this I use a locking collar and slide it up to the insulator on the bottom side of the boom. This keeps the element from being pulled into the boom by the first keeper installation. I then position the yagi so that the bottom end of the element (with locking collar) rests on the workbench (Fig 2). To make the keepers easier to force down from the top I made a tool from sweat soldered 1/4" copper pipe (Fig 3).



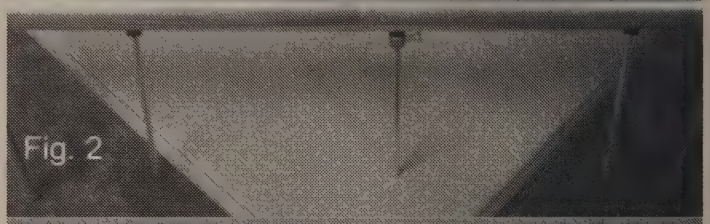


Fig. 2

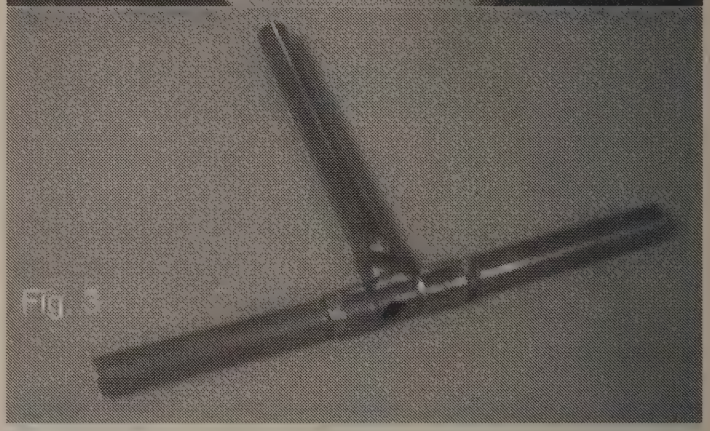


Fig. 3

I drilled a hole in the back of the TEE to allow the element to pass through. This gives you a nice handle to push on and makes it easier to smoothly seat the keepers into place. Even with the locking collar on the backside you can still compress the insulator or even the boom by slamming the keeper into place so smooth is the key.

Once the first keeper is in place you simply turn the boom over and remove the locking collar. Position the boom again where the end of the element is firmly resting on the workbench and apply the second keeper.

Remember, if you find the element has shifted from dead center you can get a slight adjustment by forcing a utility knife blade between the keeper and the insulator on the long side of the element. Be sure and put your locking collar on the short side of the element to insure it doesn't shift from the force. Once the blade is inserted rotate the utility knife 360 degrees to force the keeper evenly. (Do not pry on it). Then you can remove the locking collar and use the T-handle as a mini slide hammer from the short side tapping (not hammering) should pull the element into center.

The metric caliper was used to verify element lengths (A good idea if building more than one for an array).

Important DX Info:

The new ATV DX Record page at P. C. Electronics:
http://www.hamtv.com/atvdxrecord.html
If you have done better, be sure and send your information to Tom at P. C. Electronics. Let's hope we see those records grow in 2006!

The Hepburn tropo forecast page has a new URL and is now at:
http://home.cogeco.ca/~dxinfo/tropo.html

If you are online you can post ATV CQ's and reports to the New ATV Logger page:
http://dxworld.com/atvlog.html

ATVQ

ATN-IL New President

Hi. I am Mikayla Auerswald, KC9HVQ, 2006 President of the Rockford, Illinois, Chapter of the ATN. I am 11 years old and a 6th grader at Eisenhower Middle School here in Rockford.

When I was little, I loved talking with my dad's call sign John, KA9SOG, or mom's call sign Mary, KC9AKC, talking to hams on the area repeaters and being on the camera with the ATV. I got my call sign in the summer of 2005 in Mt. Carmel when visiting my grandparents who are also hams (Gary, WB9UDJ, and Estella, KA9SBY). A few weeks later I became KC9HVQ along with my brother Karl, KC9HVR.

Over the past few years I have helped with various public service events and doing ATV for JOTA events. Last October, I interviewed at least 200 of 5,000 boy scouts at the Aircamp of 05 coming on and off the airplanes as shown in the last issue of ATVQ. I even got to go up for my first time in an airplane and even got my Young Eagle though the Experimental Airplane Association. I was able to take a radio up with me and was able to operate as aeronautical mobile.

In December, I became the 2006 President of the Rockford, Illinois Chapter of the ATN.

I really wish that other kids would participate in Ham Radio and ATV and take part in learning about different cultures throughout the world. This place might have helped in its own little way in the world with disasters like Hurricane Katrina and Wilma. With the friendships that Amateur Radio can develop. Learning to care about others and talking to them or teaching about what might be right and wrong. Please try to get kids to participate in Amateur Radio if you can. I know, because I am one of those kids who sometimes forgets there is a world out there that is not connected to the Internet or a video game.

73
Mikayla Auerswald - KC9HVQ
Mikauerswald@insightbb.com

ATVQ

Mikayla Auerswald, KC9HVQ, (right) 2006 President of the Rockford, Illinois, Chapter of the ATN

Twentieth Annual ATV Banquet - 2005
Litchfield, Illinois

Central Illinois/St. Louis Area ATV Club
By Scott Millick, K9SM Email: smillick@wamusa.com
222 N. Jackson St.
Litchfield, Illinois 62056

An afternoon that could be best compared to an October Indian Summer day in the Midwest heightened the spirits of those traveling to the Twentieth annual Central Illinois/St. Louis Area Amateur Television Club's banquet.

This dedicated group of ATV operators arrived for another evening of renewing friendships and meeting new members. The annual banquet was held at the Ariston Restaurant in Litchfield, Illinois, which is the central location for the club with members attending from the Bloomington, Mt. Vernon, Springfield, Champaign, Canton, Illinois, and St. Louis, Missouri areas. 50 members were present for the special event.

The group was called to order at 5 PM by Scotty, K9SM, and after a few announcements the clatter of dishes, glasses, utensils and chit chat continued throughout the course of a great meal and delicious desserts.

The program began with 5 special awards presented at the banquet this year. The first was presented to Bob, KA9UVY, who received two RCA connectors. He is always complaining that the RCA video jack to his 1200 ATV transmitter will wear out due to plugging and unplugging running carrier tests with K9SM.

The second award was to Bill, K9KKL, (King Kong Lewey as told by K9IDQ in the 1950's) and Leonard, N9XHU, who both received a box of day old Casey's donuts as they go to the donut shop everyday. They are now in the local ATV circles as the 'Doughnut Boys'.

Mel, K0PFX, gave Smitty, W0DQY, and John, KD0LO, an autographed picture of himself in the QST and CQ ads for AOR. Smitty and John had stated earlier that they had always wanted one and this year they received it.

Arriving first this year was Steve Look, KA9SZW, from Monticello, Illinois. Others shortly followed and the talk about ATV openings, contesting and equipment soon reverberated throughout the room. A swap table with many ATV goodies looking for a new home was set up as well as a table with equipment catalogs to browse through and dream about.

Gene Harlan, WB9MMM, publisher of ATVQ Magazine, sent certificates to the club members attending who were winners of the recent ATVQ Contest. The following placed as follows and received their certificates at the banquet; Glen Wall, W9TZB,

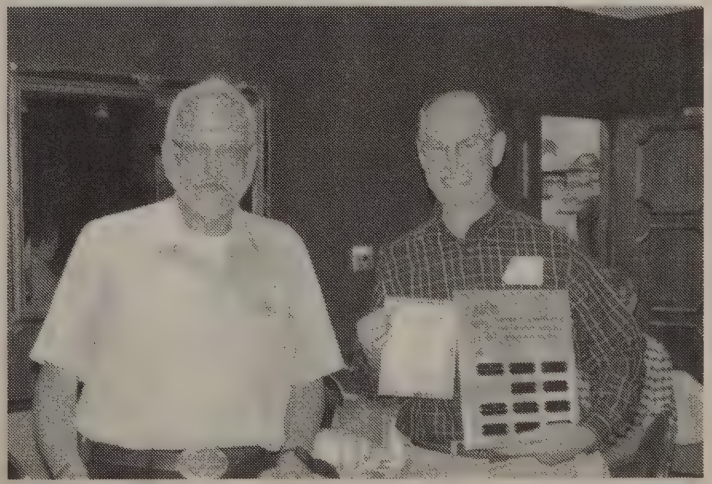
14th, Mel Whitten, K0PFX, 13th, Ron Ochu, KO0Z, 12th, Shannon Hearst, KC9BIE, 10th, Len Mason, WA9IZV, 6th, Scott Millick, K9SM, 5th, Mike Watson, KB9LII, 3rd, Bob Delaney, KA9UVY, 2nd. Leonard McWhorter, N9XHU, was awarded a certificate and plaque for the hours he spent tuning and calling resulting in his first place win. There were only 6 points difference between first and second places this year.

Mel Whitten, K0PFX, from St. Louis was the fifteenth Central Illinois/St. Louis Area ATV Operator of the Year. Mel is active on 439 and 1200 ATV and is a proficient cw operator on the HF bands. He has also done a lot of digital mode work from packet to the new digital voice modes.

Scotty, K9SM, and Kathy, WB9QLY, Millick were honored for their 20 years of sponsoring the banquet and were presented with a plaque and gifts from KA9UVY, KC9BIE, and KD0LO for their dedication in presenting the annual event for the club. The prize drawing followed which provided a lot of fun and laughs. The first person's name drawn had their choice of any of the 170 plus prizes. After that every person whose name was called could select a prize from the prize table or take a prize from someone who had already chose one. That person then chooses another prize from the prize table. This led to some of the prizes changing hands over a dozen times. Everyone left with at least four prizes. The Bird wattmeter was won by Gene Gallant, WB9LHD, from Springfield, Illinois who was thrilled with his new toy. Mark Osborn, WA9SXK, from Hillsboro, Illinois won the Heil Microphone and Kevin Loyd, N0LK, of St. Charles, Missouri won the M2 ATV antenna.

K9SM presented a DVD presentation of portions of video tapes of the ATV Banquets from 1991 to 1998. This brought back many memories for those attending of earlier ATV activity and members and gave some of the new ATVer's got a chance to see some of the faces of those they heard about and never met or worked.

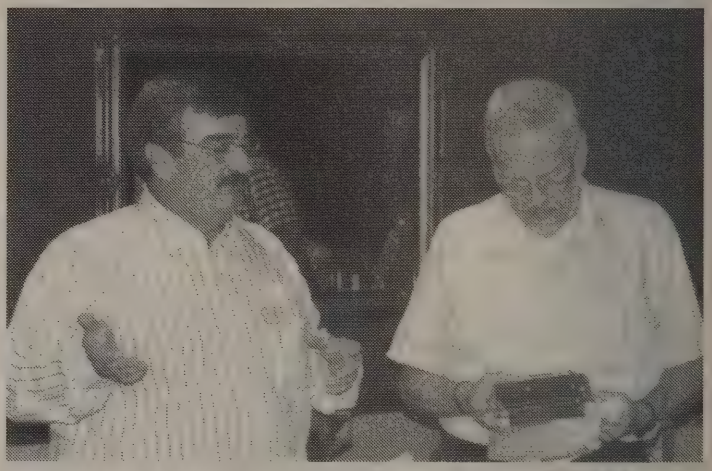
After the drawing more visiting followed and farewells were said. Everyone made their way home and are looking forward to the next banquet scheduled for November 12, 2006.



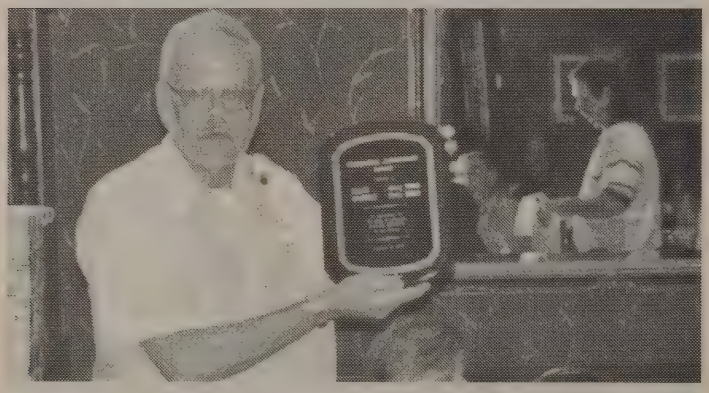
K9SM presenting trophy to K0PFX

Contest left to right - KA9UVY, KB9LII, WA9IZV, K9SM KO0Z, KC9BIE, N9XHU, K0PFX, W9TZB

K9SM receiving plaque from KA9UVY



KD0LO explaining the prize to K9SM



K9SM and plaque

The two pictures above and left were sent in by Ben, K9IDQ, along with many others. Looks like everyone had a great time.

The picture above is of the "Donut Boys" being honored. Bill, K9KKL, and Leonard, N9XHU, love to hold forth at breakfast meetings at the historic Route 66 Cozy Dog Drive Inn in Springfield, IL, nearly every weekday morning. They gather quite a crowd on some occations!

Ben also told me that it was great to honor Scott and wife for all the hard work they do every year. And he enjoyed the fact that there were so many "winners" from the ATVQ ATV Contest at this one dinner. Also, he passes a note to KA9UVY saying I enjoy your column in the ATVQ magazine. Thanks to Ben, K9IDQ, for sending in many pictures and these nice comments..

ATV Microwave TV Concepts

By John Jaminet - W3HMS - Email: w3hms@aol.com
912 Robert St.
Mechanicsburg, PA 17055

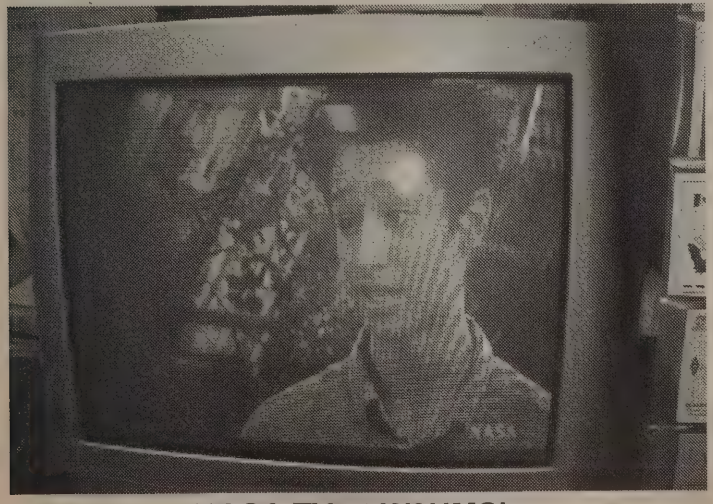
Update on using the Microwave Bands as a new approach to broadcast level Amateur TV Operations (ATV).

This article is an update of the article appearing in ATVQ for Winter 2005.

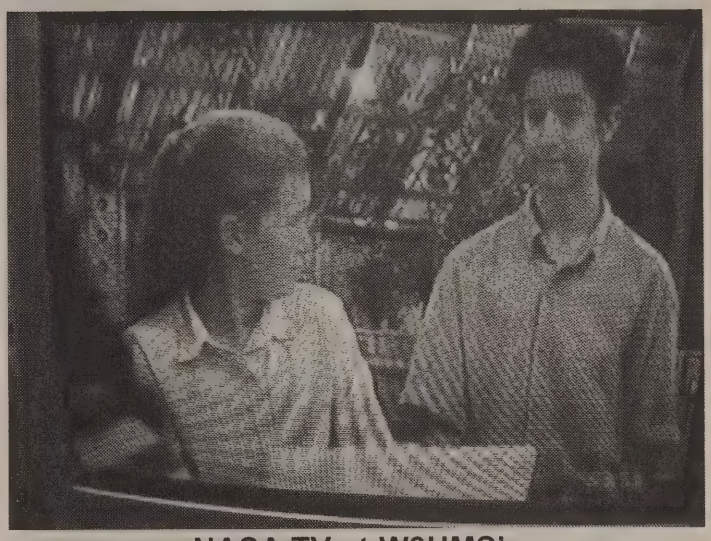
ATV has most often used the 420-450 Mhz band for in-band AM repeaters. The pictures can uncommonly be marginal with rolling, without color and without sub-carrier sound. The day that I saw a rock solid 1255 Mhz FM ATV picture between Switzerland and France was the day that I knew there must be a better way…and there is! The 9 cm band offers the possibility to use modern, high quality components designed for the mass market without modification for transmitting commercial grade pictures in FM. Additionally, this band has no competition from data communication or other unlicensed devices to the best of our knowledge.

In the Carlisle/Harrisburg, PA area, we are now operating a dual band repeater using 1280 Mhz FM input and 3480 Mhz FM output. We are currently repeating NASA audio and video. Local reception provides an outstanding full color snow free picture. In fact, our DX record is 63 miles with this kind of picture. It is perfectly legal to rebroadcast NASA video which we receive with a 24 inch dish, DishNet type LNB, and a Free to Air MPEG-2 receiver.

The standard out-of-the-box C band satellite LNB covers 3700-4200 Mhz but it will also work just fine on 3480 Mhz when followed by a satellite receiver tuned as an IF to 1670 Mhz. Now American satellite receivers do not cover 1670 Mhz but



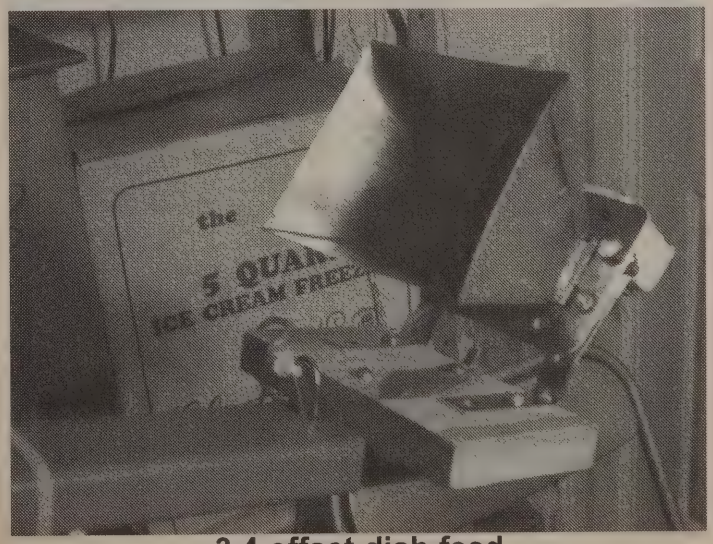
NASA TV at W3HMS's



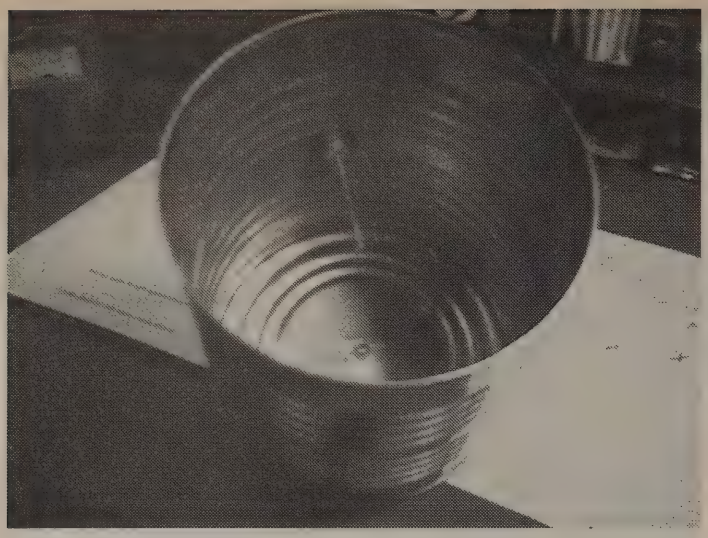
NASA TV at W3HMS's

European receivers do cover to at least 1700 Mhz and most to 2150 Mhz. The C band LNB has a 0.5 dB noise figure and 65 dB gain. We buy LNBs at $21 and European analog Pansat (Microtek) receivers ($130) which work on 117 VAC. Some close in stations use the naked LNB with a gain of about 8-10 dBi. In addition, WA3CPO has found sources for Blonder - Tongue and PICO ex-commercial satellite system analog receivers which cover 950-1750 Mhz. Gary has obtained limited supplies of these receivers to sell to members of the SMRA radio club which is our supporting club. These receivers are excellent in all aspects.

We have found that the best reception is obtained with a feed horn, designed by Paul Wade's program HDL2000, on a 24 inch



3.4 offset dish feed



23 cm can antenna

Satellite TV Receivers

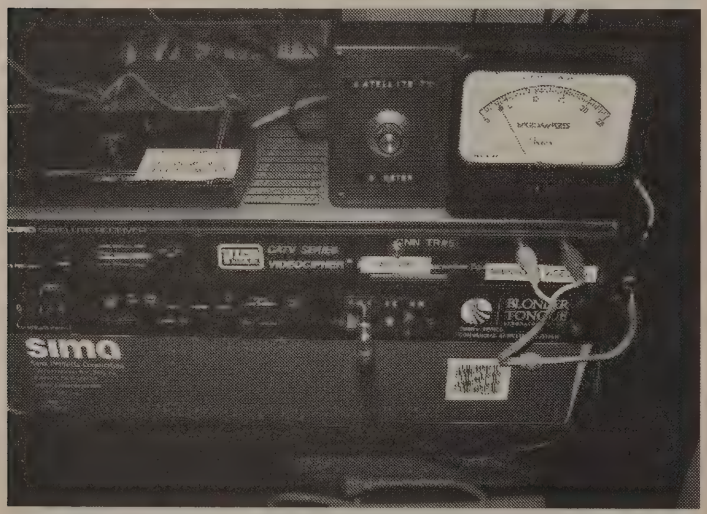
offset dish now available at about $30. The transmission antenna is either a panel antenna with about 135 degree coverage or an omni with 11 dBd gain. We use vertical polarization on both reception and transmission as omni-directional antennas for this polarization are more readily available than horizontal antennas. The project leader for this ambitious project is Gary Blacksmith, MD, WA3CPO, who has obtained an excellent site with a 100 ft tower. We are using a commercial grade exciter with about ten milliwatts output to the Toshiba 40 watt amplifier. These amps, which need only one mw of drive, are often used by 9 cm weak signal operators of which I am one.

We found that these amps really generate the heat in the summer months and they require a large heat sink with the fins pointing up. By large, we mean about 2 or more times the surface area of the amp. In addition, we have installed thermometers designed for indoor and outdoor use on the amps with the outside probe mounted on the hottest part of the heat sink. The summer temperature difference between chassis and the hottest part of the heat sink is about 20 degrees F.

Since this rework, we have had excellent service for the primary White Rock repeater and the new 3420 Mhz beacon mounted at the WITF-TV Ch-33 site north of Harrisburg.

With 2200 Mhz of separation between input and output, we have found no need for filters as commonly used on in-band repeaters. This mode has permitted each station to see their own picture which does make adjustments quite easy.

For 1280 Mhz transmission, our tests have confirmed that the Videolynx Z23B with 2 watts output produces broadcast quality video as may other units in the market place. We envision close-in stations can use a neat little #10 food can antenna with probe as employed by F4DAY at his QTH. Others can use higher gain antennas based on signal needs/distance. For additional power, several of us use the 30 watt DEMI linear amplifier which is equipped with a large heat sink. It is ideal for long transmissions and I find that I have often transmitted for 30-40 minutes without generating excess heat.



Blonder Tongue and PICO Sat TV recievers

Central PA ATV Meeting

Central PA ATV Meeting

The sound deviation from this transmitter is much less than the 200 Khz needed for a satellite TV receiver. We have asked Ravi for a solution which is in process.

We have expanded reception to include linking of two other local repeaters into our controller. Our inputs in priority sequence are:

#1 is 1280 Mhz FM

#2 is York 439.25 Mhz AM repeater

#3 is 421.25 Mhz N3KYR repeater

#4 is NASA video

#5 is a local tone select camera

This linking has permitted ATV hams in 3 geographic areas to exchange very high quality P5 pictures which could serve local emergency organizations.

Current projects include a 10 GHz 1 watt DRO link using a 30 inch dish with a modified KU band LNB to pass video and sound among two to- be- selected sites and making the 3420 Mhz beacon more usable with one or more cameras covering the building/grounds and city skyline.

This is an update to a concept article designed to share what we feel are some very effective approaches to modern ATV. For further information, please contact John Jaminet, W3HMS at W3HMS@aol.com.

ATVQ

Multilabs Announces The ezDISPLAY Graphic Serial LCD Module with Touchscreen

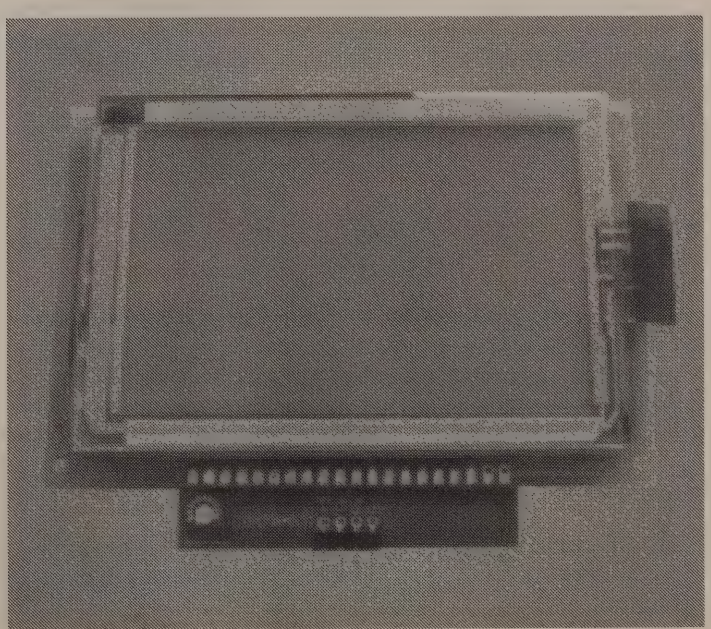
Multilabs is pleased to announce its soon to be released newest product, the ezDISPLAY. The ezDISPLAY is a feature-rich 160 by 80 graphic serial LCD module with integral touchscreen. The combination of the graphic LCD and touchscreen makes a powerful user interface in a all-in-one product. Its powerful command set consists of graphic and text commands, floating character control for a point and click interface, reading of the touchscreen touch position for external uses, and more! Memory is provided for user defined characters to supplement the built-in ASCII character set and for saving your favorite screens. All saves are made to non-volatile memory so power loss is not a problem. The floating character can even be "latched" to the touchscreen so a pointer can automatically follow the user's stylus around the LCD screen. There are too many features to discuss here. A copy of the user manual can be downloaded from our website here:

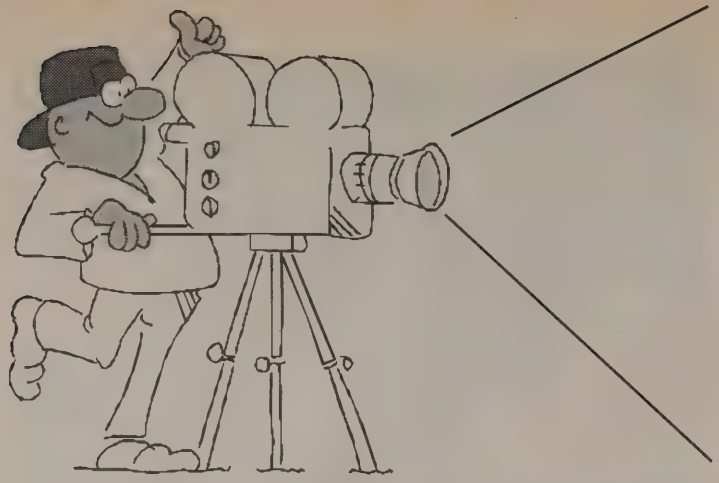
www.multilabs.net/News.html

You can then read about the ezDISPLAY in detail. The ezDISPLAY is scheduled for release by early to mid January 2006. If you have any questions you can call (949) 458-7625.

Best Regards,
Multilabs Support

ATVQ





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Gene Harlan - WB9MMM - Editor/Publisher

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SPRING	April 1	April 15	May 1
SUMMER	July 1	July 15	August 1
FALL	October 1	October 15	November 1

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So, You Want To Put Up A Tall Tower?

By Henry Ruhwiedel - AA9XW Email: a9xw@cs.com
5317 W. 133rd Street
Crown Point, IN 46307

We all want a big stick in the air, but local zoning and hams still have some conflicts despite PRB-1. Here is a check list of things that will help you get that desired big tower.

PRB 1 is not a club to stomp every local ordinance to dust, and if you approach the project in that manner, the local regulators are sure to make your day ... not. PRB 1 simply says that local zoning and other restrictions cannot prohibit you from having an antenna, but local laws must provide a "reasonable" allowance to exercise your ham radio license privileges. The big problem is defining "reasonable." Reasonable is usually defined in local circumstances. Local circumstances being your property relative to your neighbors.

PRB 1 does prevent arbitrary laws that prohibit any use, or deny towers because of aesthetic reasons. Just because a neighbor thinks towers are ugly does not mean they can prevent you from having one.

Property rights, utility easements, and fall radius are often cited by regulators to deny permits for towers. Many cities now have ordinances that allow towers to a certain height. Commonly 50-75 feet is permitted by ordinance, and only structures that exceed that require a variance and hearing. If you need to put up a taller tower than permitted, be prepared to show how you can do this safely and why it is necessary. Even if there is an ordinance allowing ham radio towers, you may still need to prepare an application to show what you want is in compliance. Different localities have different requirements, so it is a good idea to talk to the local planning or building commissioner before you even start.

Dealing with "City Hall:" You want to present a professional appearance, convince them you are informed, not by what you say, but by what you ask and the information you present. Have the following documents handy: plat of survey showing your property boundaries, location of fixed structures, location of your proposed tower, dimensions and distances from the tower base to the property line. Have a second carefully drawn exhibit showing all the adjoining property buildings and the distance to the nearest point of those structures from your tower base.

You should have the tower manufacturer's EIA222E specifications and drawings of the tower and most importantly the base requirements. Photos are helpful. If the tower is used, try and have photos of it standing prior to take down, then photos clearly showing the pieces on the ground. If the tower is rusted or has broken elements, these will have to be cleaned and repaired. All erection hardware (tower bolts) should be new and at factory spec.

Often "City Hall" will want an electrical diagram showing grounding. The building inspector will visit after the tower base is in, or after the tower is up but without antennas, to make sure your ground mounted lightning rod is well grounded. Inquire what is required and then offer to meet or exceed that specification. While a simple single 8' rod connected to the tower base section leg with #8 or larger wire is all that may be required, good grounding is part of good engineering practice, and having more than 1 rod, and using strap or large gauge connecting wire reduces the inductance, increases the current handling, and reduces soil resistance. That will reduce noise in your antenna system by reducing the voltage drop across the tower resistance. My personal preference is for cadweld connections, because clamps offer limited contact area can work loose and corrode and at least #4 stranded wire, up to 500 MCM copper on taller towers. The taller the tower, the more voltage is developed between top and bottom, which means higher currents in the ground system. Some towers will even have section to section electrical jumpers since bolts and mating surfaces will corrode over time increasing the resistance at each joint in the tower.

Your application needs to be neat and clearly drawn. Use a ruler, and other drawing aids and a fluid ink pen. Date and sign the pages and diagrams. Always include the address on any plat drawings and adding it to the other exhibits also aids the process should the items get separated in the city red tape systems.

If you meet the items above you should have a minimum of problem getting the permit for a tower that is within the zoning laws. But what if you want a tall tower, or the zoning you feel is restrictive, say 20 feet? You will need to apply for a variance. If there are other ham towers in your area, that is certainly helpful, but no guarantee since structures are usually "grandfathered" when the rules change. It is certainly a reasonable argument to make that there are other towers as tall as or taller than what you propose, and if presented properly may be persuasive. City Hall may also hire an expert to consider your case. You can have one also. The hired expert's job is to render an opinion based on facts presented to determine if the variance is reasonable, required, and if the variance is required to provide a "reasonable accommodation" as required by PRB-1. The expert will review any exhibits, testimony and relevant information from credible sources to reach a determination. That may include research to determine the tower specifications, loading, base requirements, the validity of your ham license, and proof of any other testimony or exhibit provided. The decision makers will then make their decision on what has been presented to them, exhibits, testimony

and the expert's opinion. The expert is not there to side with the applicant or the city, but provide a neutral expert opinion. In public hearings you can present further information, correct errors, and ask the witnesses called (typically the building inspector, planning commission representative, and anyone else who "has an ore" in the water and the hired expert).

From my experience as an expert witness I have noted a few things that will kill your chances of getting a variance.

Attitude as seen by the deciding body: If you present yourself professionally, you are much better off than if you make demands, wave your license and claim PBR-1 gives you rights it does not.

Paperwork conflicts: Make sure the application does not have conflicts in data. The diagrams must match what you propose. Photos must be of the actual tower, not another one in your or a friends yard. Usually you should show easements, utility locations and show that your tower and its base/supports will not be a hazard during or after construction.

Make sure your address is consistent. A license that has one address and a FCC or QRZ check shows another address and the application shows a third address immediately calls your candor into question. If there are differences, be prepared to show documentation why there are differences. If you recently moved or upgraded, provide proof of your having moved or upgrade to explain why what you presented is different than what the documents show.

If your tower is very close to adjacent property not your own, you will need to show that you will not violate their air rights (your antenna cannot extend beyond your property boundaries) or that you have their written permission to do so. Also be able to show that the method of erection is safe, and cannot cause harm to property not your own. If your tower height exceeds the distance to the nearest neighbor structure, have an exhibit showing how your proposed tower would be prevented from destroying the neighbor's house, garage etc. (A fall limiting device, such as a back guy). The worst answer is "that's what insurance is for." Public safety is one of the main concerns that must be addressed for variances.

Lastly, PRB 1 says "reasonable accommodation" which does not mean every accommodation. Your application should indicate that the tower is for general ham communications within the limits of your license. City Hall is not in a position to evaluate a request for a particular mode, frequency, or communicating to yourself at another location. One city was approached by what clearly seemed to be a commercial wireless internet operation complete with terrain profiles, guaranteed service signal levels and used ISP hardware which "just happened" to be on a band shared by ISP and ham radio and aimed so as to only be able to communicate with a public access site holding an commercial ISP system. The applicant stated that no one else would be able to use the system, but that it would assist "public safety." The applicant further stated that he owned commercial ISP wireless systems in the area. The city was convinced from the applicant's own testimony that he was trying to put in a commercial service under the guise of his ham radio license. Even the local competing ISP owner objected.

Proposing a tower 50 times higher than the distance to your property line or 3-4 times higher than any tree or building in sight is not going to pass the public safety criteria for a ham tower.

Interference issues: The Federal law limits any question of interference to the jurisdiction of the FCC. But if someone does bring up the question, be prepared to provide a simple answer of why it is not likely to happen, not techno-babble that will be taken as "you are trying to hide something." Simply mention that the FCC is the only agency that can deal with interference matters, and while some consumer devices are susceptible, it is unlikely to be the case because: power levels, distance, modulation differences, other appropriate mitigating circumstances.

Every ham should be able to erect an antenna, but we also need to be mindful that our requests need to show a reasonableness and awareness of the rights of others.

ATVQ

Congrats To ATVQ

Just got my latest issue of ATVQ, another great issue. Keep up the good work. - Henry - AA9XW

Sure was, Henry... Most expensive magazine I subscribe to... but always very interesting.

Now, if there was just some FSTV activity in my area. The closest is Wichita, KS and Oklahoma City. Perhaps some of you out there would like to emigrate to Amarillo? You could work for our handy nuclear weapons plant... or help make the new helicopters (which crash only occasionally).

You will have to buy purified water to drink, but we do have a good symphony, opera, and ballet! Any takers?

Gene, WA5ETK

Gene,
Maybe we could work on a couple of HUGE arrays, and work each other here in Texas. I live down near Texas A&M (Bryan/College Station area). I have the gear, but no one else seems to, or they no longer have any interest. SSTV is somewhat popular on VHF in the Temple and Waco areas. There is a VHF repeater used for it between Waco and Temple.

Take care all, and if ever we can get something going down this way, I'll post it here first.

Paul N5XMV

Adjustable Back Porch

By Gene Harlan - WB9MMM Email: atvq@hampubs.com
5931 Alma Dr.
Rockford, IL 61108

Got several video signals going into your repeater or video switch and using those signals at the flip of a switch into your transmitter. Have you ever seen that one video is better than another and wondered why? Ever had a sync problem with some video and not with others? Well, maybe this article will help.

We had the above happen with our repeater here in Rockford, Illinois, W9ATN, where if you looked at the video out of the controller, the video did not look the same when comparing the sync and video levels. Sometime ago I found a chip that seemed to address these issues, the Maxim MAX7452. To borrow a little from their data sheet, there are actually three versions to describe.

Description

The **MAX7450/MAX7451/MAX7452** complete front-end video-signal conditioners are designed to improve the quality of standard-definition video signals. The devices restore the DC level of the video input, correct for amplitude errors up to ±6dB, detect fault conditions, and filter out-of-band noise. The MAX7450/MAX7451/MAX7452 optimize the signal quality for further video processing through a crosspoint switch or video decoder (ADC). Each device integrates an input video clamp, automatic gain control (AGC), loss-of-sync (LOS) detector, and an out-of-band noise/lowpass filter. These devices also incorporate a user-selectable buffer gain (0 or +6dB) and an AGC-disable function. The MAX7450 and MAX7451 operate from dual power supplies of ±5V or ±3.3V respectively, and they restore the video blanking level to GND. The MAX7452 operates from a single +5V supply and features a user-adjustable clamp level.

Features

- **Back-Porch Clamp to GND (MAX7450/MAX7451)**
- **Adjustable Back-Porch Clamp (MAX7452)**
- **Automatic Gain Control (±6dB Range) Normalizes Signals to Standard Video Level**
- **Input Fault Detection with LOS Output**
- **Inherent 50Hz/60Hz Input Rejection of 60dB**
- **Single-Supply Operation: MAX7452 (+5V)**
- **Out-of-Band Noise Filter**
- **Output Buffer Drives Standard 150. Video Load with 0dB or +6dB Gain**
- **Dual-Supply Operation**
  MAX7450 (±5V)
  MAX7451 (±3.3V)
- **Tiny 8-Pin SO Package**

Video-Signal Conditioners with AGC and Back-Porch Clamp

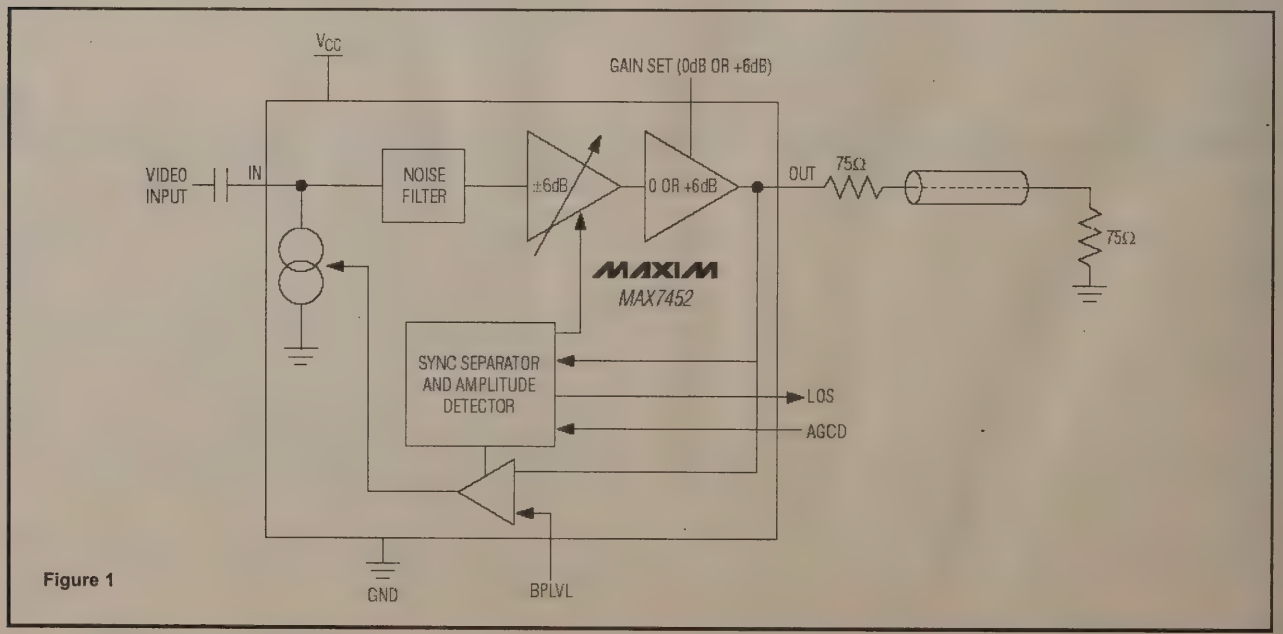
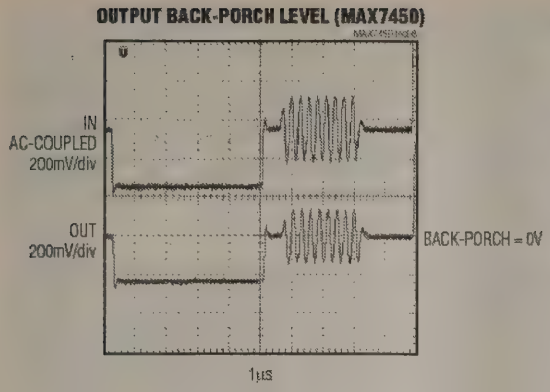
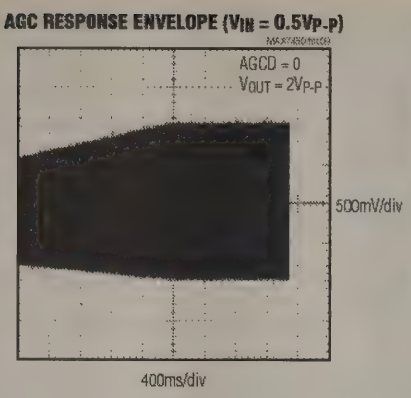
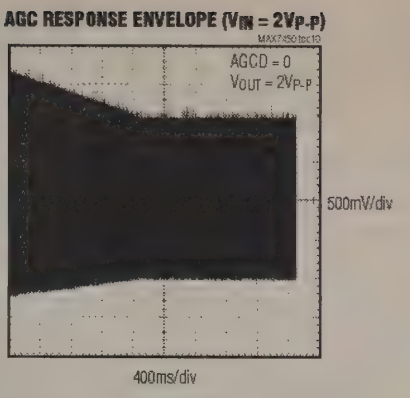


Figure 1

MAX7452 Functional Diagram

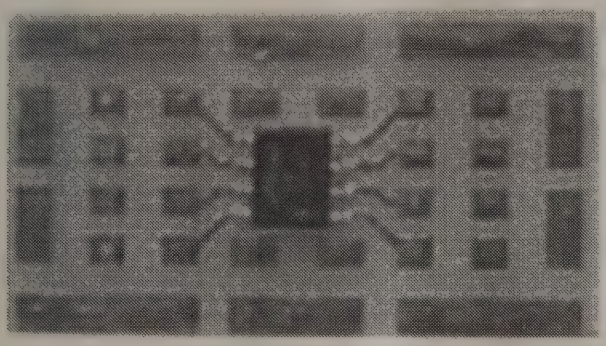






So, the specs looked good, but will it really perform as stated? I ordered samples (Maxim is great for sending samples!) and made plans to build a unit to test.

*The first hurdle to tackle is the fact that this IC is surface mount. I looked for some prototype boards for surface mount and found what I wanted at Jameco (**www.jameco.com**). The part number I used was 207360CB and sells for $1.35 for 1 or $1.22 each in quantity 10.*

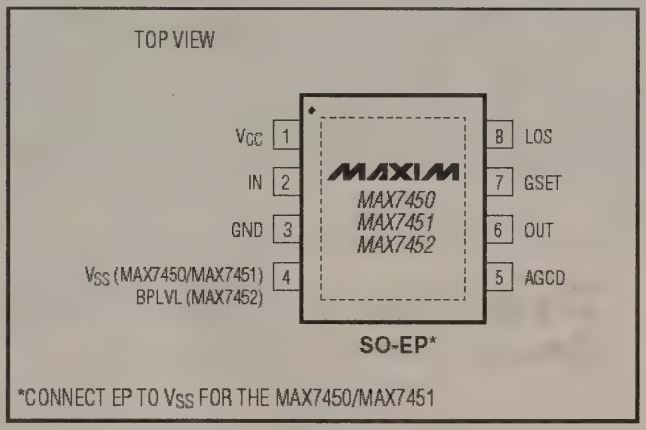


The device I chose is made for a single supply, + 5 volts. The other devices use either ±3 volts and ±5 volts. I preferred to make this project with a single 5 volt supply. But, since I was going to power the box with 12 volts, I have to add a 5 volt regulator, a LM340T5.

The schematic at the bottom of the page is Maxim's Kit and I basically used what you see. I did put in a variable pot in for the resistor divider network connected to the BPLVL pin 4.This allowed me to play with the level and observe what happens as you change the back porch. It was a learning project.

Detailed Description

As shown in Figure 2, the devices include a 2nd-order lowpass filter intended to reject out-of-band noise. The



MAX7450/MAX7451 clamp the back-porch voltage to ground, and the MAX7452 clamps to a user-supplied reference voltage. These devices also include an automatic gain control (AGC), which automatically adjusts the gain to ensure the sync amplitude is normalized to a standard video level; an AGC disable function; and an output driver that drives a standard video load (150 ohms) with a full 2VP-P video signal (GSET = 1) or 1VPP video signal (GSET = 0).

The clamp and the AGC work concurrently. Interaction between the two different control loops is eliminated by the large difference in time constants. The time constant of the clamp settles within 100 lines, while the AGC loop is digitally stepped so that it settles between 1000-64,000 lines.

Video-Signal Conditioners with AGC and Back-Porch Clamp

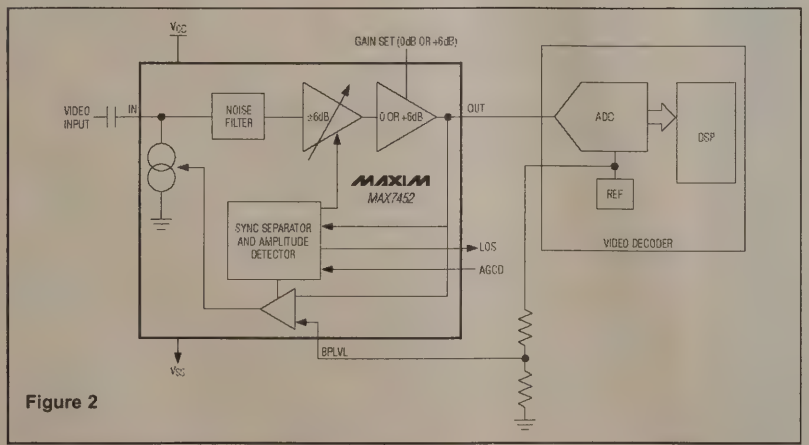


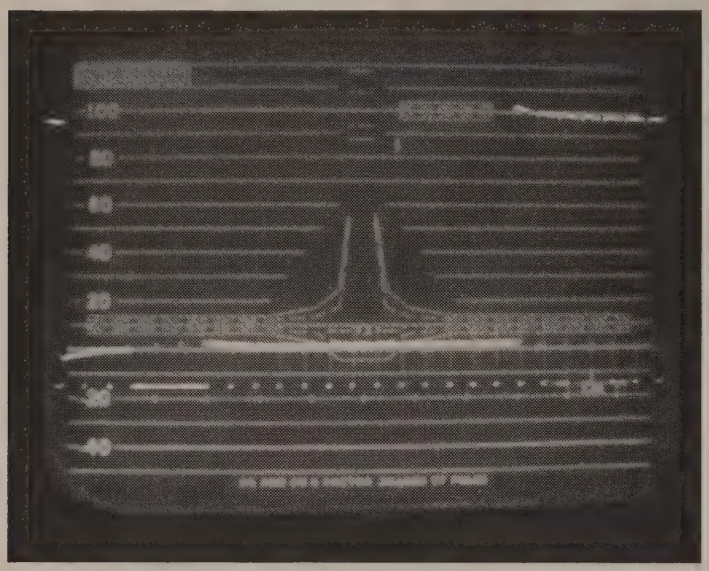
Figure 2

MAX7452 Interfaced to a Video Decoder

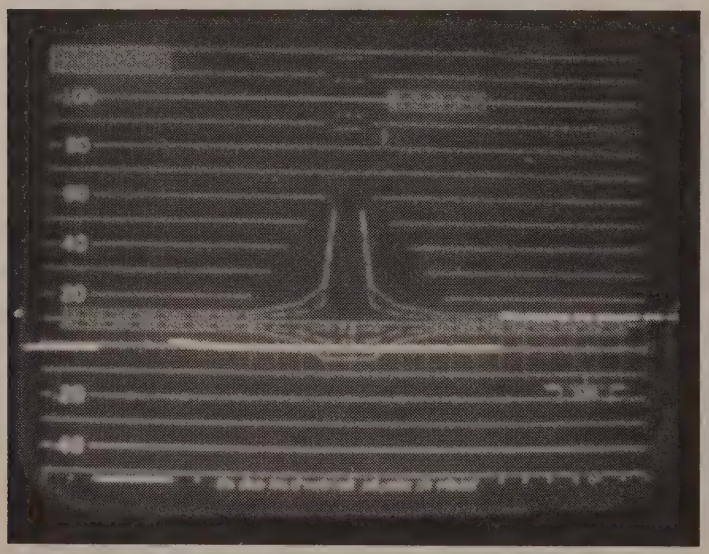
The AGC control works independently of the gain setting of the output buffer. The overall gain is the multiplication of the AGC gain and the output buffer gain. The maximum overall gain is +12dB and the minimum gain is -6dB.

Back-Porch Clamp

The MAX7450/MAX7451/MAX7452 feature a backporch clamp to set the output blanking level. The devices sense the voltage during back porch and feed back into a control system. The control system provides the appropriate DC-level shift to clamp the output to ground (MAX7450/MAX7451) or to a voltage set by VBPLVL (MAX7452). This restores the DC level for further video processing such as on-screen display (OSD) insertion and analog-to-digital conversion. The backporch clamp to ground also eliminates the need for large output-coupling capacitors that can introduce unwanted line-time distortion (tilt) and cost. This can also reduce board space. The feedback network and the on-chip capacitors introduce a finite settling time after power-up or after any dramatic shift in input voltage (see the Electrical Characteristics section).



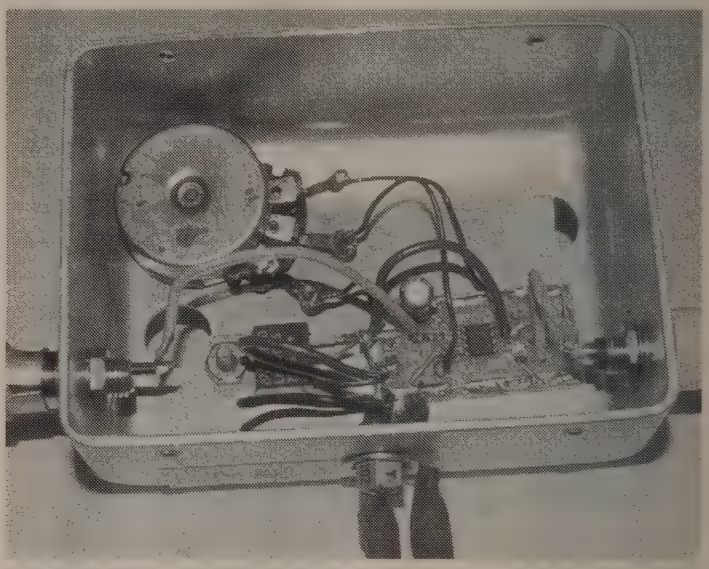
By using a variable resistor with the center of the pot connected to pin 4 (BPLVL) instead of the two fixed resistors shown in figure 1, I was able to see the effect of changing the back-porch-output level and I could see in a video monitor the effects. In most applications you would want the two fixed resistors. Above shows the back porch too short and below, showing that there is lots of range.



Back-Porch Level Input (MAX7452)

The MAX7452 features an adjustable back-porch level at the output as shown in Figure 1. VBPLVL sets the back-porch clamp level. The back-porch clamp-output level is defined by the following equations.

GSET = 1 (Gain = 2V / V), VBACKPORCHLEVEL = VBPLVL
GSET = 0 (Gain = 1V / V), VBACKPORCHLEVEL = VBPLVL / 1.5

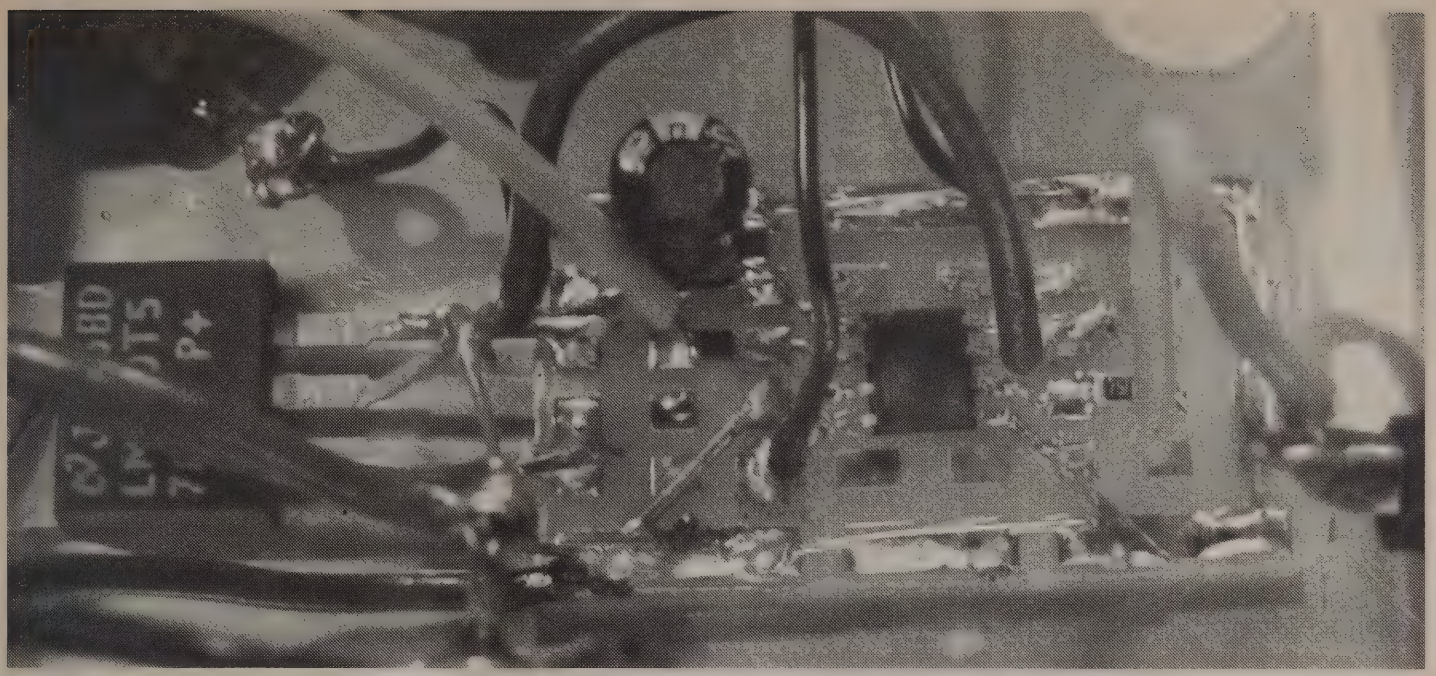


Overall of the inside of the project showing proto board from Jameco. Surface mount can be done at home!

Having several video sources, none with the same video voltage, can be solved with the MAX7450/MAX7451/MAX7452 chips as they have an automatic gain control. This seems to me that having several of these around our ham shacks, maybe one for EVERY video source, would be a great idea!

Automatic Gain Control (AGC)

The MAX7450/MAX7451/MAX7452 have an integrated automatic gain-control circuit to ensure the sync amplitude is normalized to the standard level, thus normalizing the overall amplitude to a standard level. The accuracy of the normalized amplitude assumes the ratio of active video to sync amplitude is correct in the input video signal. The gain is adjusted automatically by detecting and comparing the amplitude of the sync pulse to a fixed internal reference. If the sync amplitude is less than this value, the overall gain is increased until the sync amplitude equals this reference. However, if the sync amplitude



Closeup of the project. 5 volt regulator on the left.

is high, the overall gain is reduced accordingly. Disable the AGC loop by driving AGCD high.

When designing the overall system, it is important to note that the AGC can correct for termination problems. First, disable the AGC and verify that the terminations are correct, and then enable the AGC for proper operation.

Output Buffer

The output buffer of the MAX7450/MAX7451/MAX7452 is designed to drive either standard video loads or high-impedance loads, independent of the buffer gain. Logic levels on GSET and AGCD set the gain of the MAX7450/MAX7451/MAX7452.

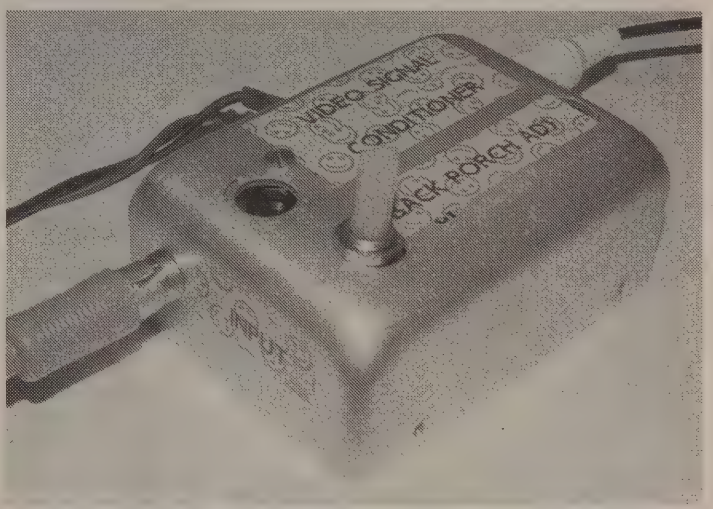
Noise Filter

The MAX7450/MAX7451/MAX7452 feature a simple 2ndorder lowpass filter to reject out-of-band noise that may be introduced by the long cable connection between the cameras and the switching matrix.

The following feature, the LOS detector, could be very useful to ATV'ers. I've thought about using this chip for turning on/off the sound and CRT of my monitor whenever there is a signal present. Is it better or worse than existing designs? I don't know. For the ATV DX'ers, you could have it sound an alarm when video was present.

LOS Detector

The LOS detector of the MAX7450/MAX7451/MAX7452 outputs a logic high when the sync is not present (loss of video signal) for at least 15 horizontal lines on the input. This can be used to indicate a fault condition of the camera or cable.



The outside of the Video Signal Conditioner

Applications Information
Interfacing the MAX7452 to an ADC

The MAX7452 can be directly connected to an ADC or video decoder as shown in Figure 2. The video output of the MAX7452 is DC-coupled to a single-ended video input on the ADC. The voltage on the BPLVL pin sets the black level of the video signal at the output of the MAX7452. Use a stable voltage reference for the BPLVL voltage, ideally the same reference that is used for the analog-to-digital conversion. This voltage must be scaled by a ratio of two resistors to set the black level of the video signal to the appropriate level (to match the input range of the converter).

If the ADC or video decoder has a built-in clamp circuit, the output of the MAX7452 must be AC-coupled into the ADC with the capacitor value recommended for the converter. In this situation, set the BPLVL on the MAX7452 to the midpoint of the

PIN		NAME	FUNCTION
MAX7450/ MAX7451	MAX7452		
1	1	V_{CC}	Positive Power Supply. Connect +5V to V_{CC} for the MAX7450/MAX7452. Connect +3.3V to V_{CC} for the MAX7451. Bypass to GND with 1µF and 0.1µF capacitors as close to the pin as possible.
2	2	IN	Video Input. AC-couple video signal through a 0.1µF capacitor.
3	3	GND	Ground
4	—	V_{SS}	Negative Power Supply. Connect -5V to V_{SS} for the MAX7450. Connect -3.3V to V_{SS} for the MAX7451. Bypass to GND with 1µF and 0.1µF capacitors as close to the pin as possible.
—	4	BPLVL	Back-Porch Level Input. When gain = 2V/V (GSET = 1), output back-porch level is equal to BPLVL input. When gain = 1V/V (GSET = 0), output back-porch level is equal to $V_{BPLVL}/1.5$.
5	5	AGCD	Automatic Gain-Control Disable Input. Disable AGC by driving AGCD to V_{CC}. Enable AGC by driving AGCD to GND.
6	6	OUT	Video Output
7	7	GSET	Gain-Setting Input. Drive GSET high to set buffer gain to +6dB. Drive GSET low to set buffer gain to 0dB.
8	8	LOS	Loss-of-Sync Logic Output. LOS is high when video sync is lost for more than 15 horizontal lines. LOS goes low when video sync is present.
—	—	EP	Exposed Pad. Connect to V_{SS} (MAX7450/MAX7451). Connect to GND (MAX7452).

specified range for optimum performance. In addition, the stability of this voltage is not critical, provided that it stays within the specified range.

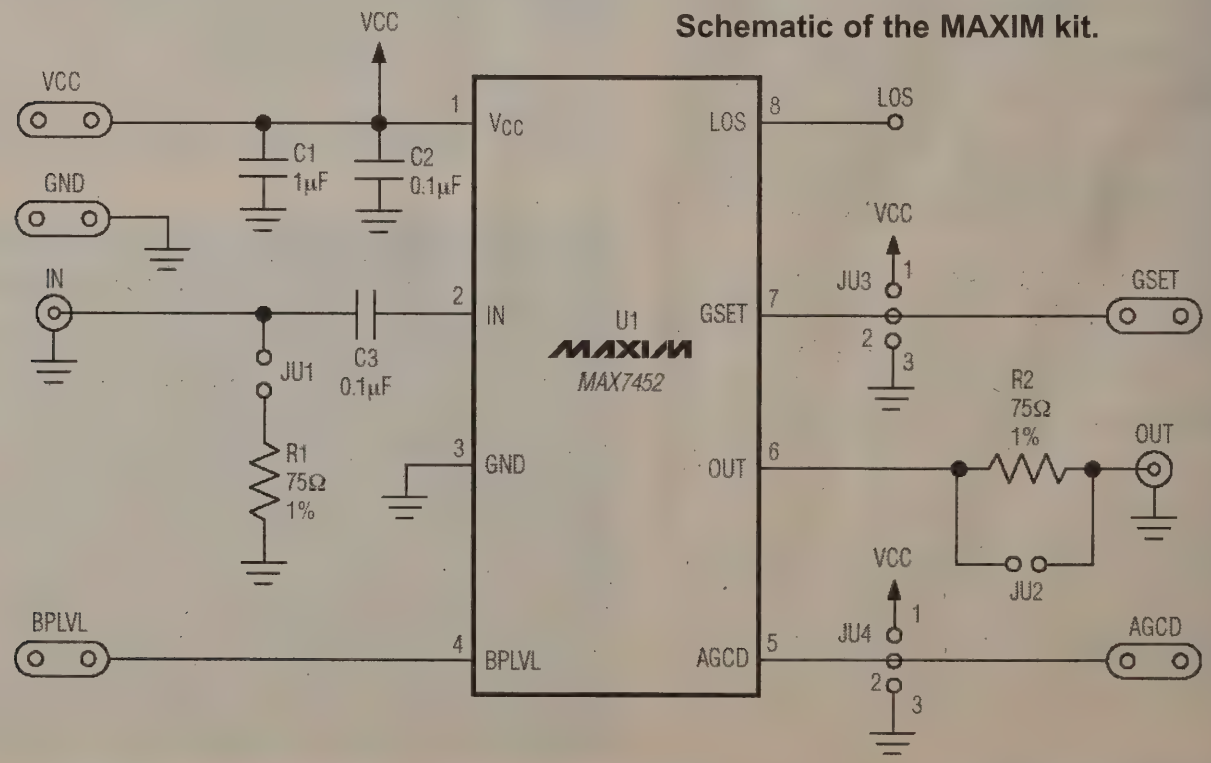
Power-Supply Bypassing and Layout

Bypass all supply pins to GND with 0.1µF and 1µF capacitors. These capacitors filter higher frequencies in the MHz range. Place all external components as close to the devices as possible. Connect EP to VSS for the MAX7450/MAX7451. Connect EP to GND for the MAX7452. Placing the IC onto a copper area the size of the pad is recommended for proper power dissipation. Refer to the MAX7450 Evaluation Kit for a proven PC board layout example.

A lot of this article was taken direct from the MAXIM data sheet. More information can be found on their web site and you can get samples by going to ***www.maxim-ic.com***.

ATVQ

Schematic of the MAXIM kit.



Product Evaluation
Downeast Microwave 2360PA

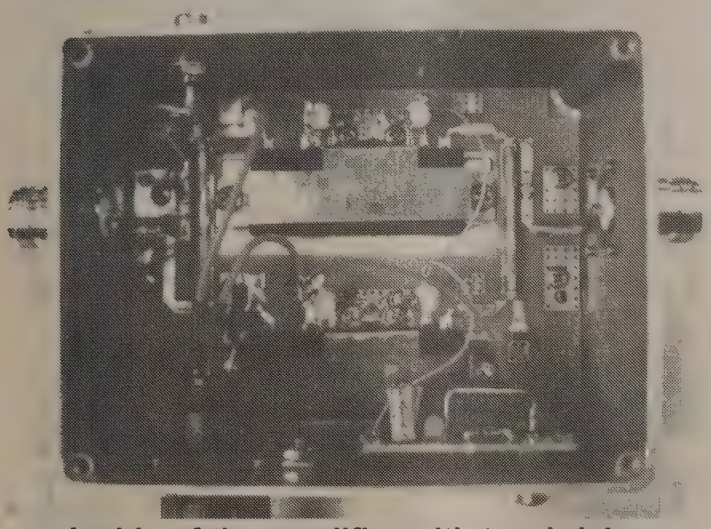
By Mike Collis - WA6SVT Email: wa6svt@aol.com
POB 1594
Crestline, CA 92325

Introduction:

For years Down East Microwave has produced quality1.2 GHz linear power amplifiers utilizing the bipolar type brick amplifiers with good results for AM or VSB ATV on 1.2 GHz band as well as other models for the other UHF and microwave bands. Bipolar bricks are going to be discontinued and a new Enhancement Mode MOSFET brick the RA18H1213G is the only current replacement covering the 1.2 GHz band.

New MOSFET Power Amplifiers:

Down East Microwave has developed the three power ranges of amplifier based on this new MOSFET brick however it was not recommended for AM ATV use. I decided to ask Steve from Down East if he would supply one of his amplifiers for an evaluation, he graciously sent me the 2360PA a two brick amplifier for evaluation.



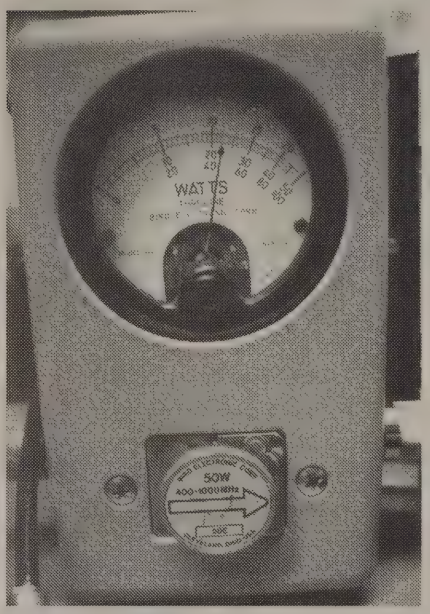
Inside of the amplifier with two bricks phased together, PTT control board and power out monitor circuit.

Evaluation General:

This well built $400 amplifier is rated as 60 watts linear (SSB mode) 80 watts saturated (FM or CW) covering the entire 1240-1300 MHz band. Input is 250 mw max and 150 mw linear mode. Power is 13.8 volts at 20 amps full saturated output. The amplifier performs as advertised.

Evaluation ATV:

VSB or AM video mode is a little different. For the purist who wants no more than 1 IRE units of sync compression and 3rd order sidebands down -50 dBC (lower aural carrier) this amplifier will produce15 watts sync tip power and for the more realistic ATVer 30 watts sync tip power with -45 dBC 3rd order and about 2 IRE units of sync compression is what this amplifier will produce. I was able to slightly improve on the sync compression by adding a 2,200 microfarad capacitor on the 13.8 volt power rail.



Bird 43 with peak detector on confirming 22 watts peak sync output.

It should be noted that even with the older bipolar brick amplifiers, to have low sync compression and moderate 3rd order levels, it was necessary to run a 60 watt amplifier at no more than 40 watts sync tip. What is different here is both compression and 3rd order intermodulation is less at the 30 watt level. When the amplifier is pushed above the 45 watt level, the sync compression and intermodulation distortion increases significantly. The drive requirements are 10 dB less than the bipolar 60 watt amplifier requiring only 150mw max drive for VSB or AM ATV.

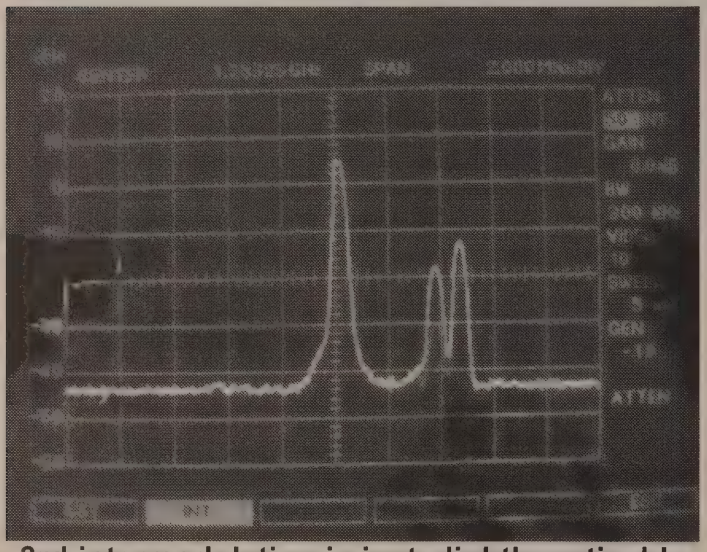
Recommendations:

This amplifier needs a larger heat sync for continuous operation and the model 2360PAS ($50 more) should suffice if a fan is added to it. If used at a repeater site, I would recommend getting rid of the plastic power connector and add a high current feedthough capacitor to bypass the power leads to reduce RF radiation out of the amplifier.

EXICITER:

My VSB ATV exciter is a Standard Communications TVM-450 VSB TV Modulator heterodyned from 250.25 MHz to 1253.25 MHz using a 1 GHz +17 dBM LO into a Mini Circuits ZLW-11H +17 level mixer followed by a 4 pole filter (covers 1240-1295 MHz) and a Mitsubishi M67715 1.5 watt amplifier running at 150 mw output. The lower aural carrier out of this amp ran at 150 mw was -52 dBC with the aural carrier set at-12 dBC.

3rd order (lower aural) Intermodulation at -40 dBC at 40 watts peak sync output (40 dB attn pad added) note the spectrum is still relatively clean.



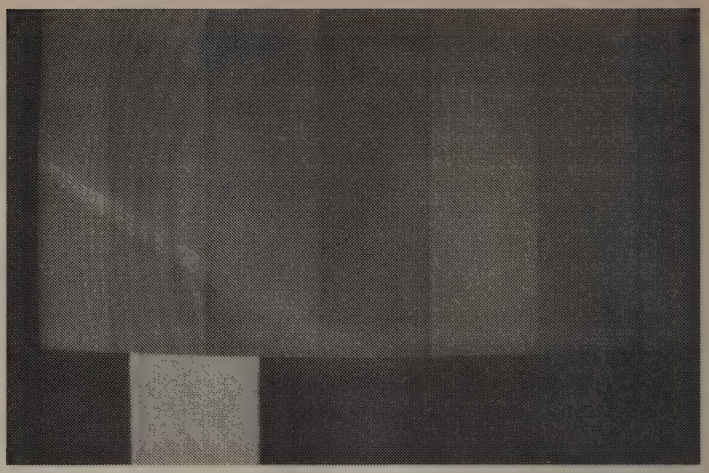
3rd intermodulation is just slightly noticable in the grass at the 22 watt peak sync output.

Test Setup:

Test equipment used for this evaluation is a bird model 43 with peak detector option and power attenuator ahead of an IFR 930A Spectrum Analyzer. The TV demodulator was an Icom R3 feeding a Videotek 13 Pro video monitor and Tektronix 528 waveform monitor.

Final Comments and Recommendations:

I would recommend this amplifier for VSB or AM ATV use at the 30 watt peak sync tip level (about 30 watts with video removed from the transmitter). I do not recommend pushing the amplifier past 40 watts sync tip power due to added sync compression and increased intermodulation distortion causing spectrum re-growth. Do not push the amplifier near saturation with AM or VSB video modulation as the intermodulation becomes significant causing splatter to adjacent channels above and below the ATV channel.



Demodulated 1253.25 MHz VSB signal as desplayed on a video monitor, note the lack of video artifacts (except light reflecting from the monitor screen) and broadcast quality picture displayed.

I have found that in a single brick MOSFET amplifier I built that adding a 1 UF surface mounted cap inside the brick bypassing the 390 ohm bias resistors in each of the gate bias circuits improved the sync compression at higher power levels but did little to improve the intermodulation distortion causing spectrum re-growth. I also do not recommend getting into the brick for this modification unless you have experience with this type of circuitry and would void the amplifier warranty.

I want to thank Steve from Down East Microwave for allowing me to evaluate this quality amplifier. I do plan to purchase the amplifier for use in ATN's new ATV repeater at Point Loma near San Diego California. I hope you to will find this amplifier worthy of providing quality and power to your ATV 1.2 GHz signal.

ATVQ

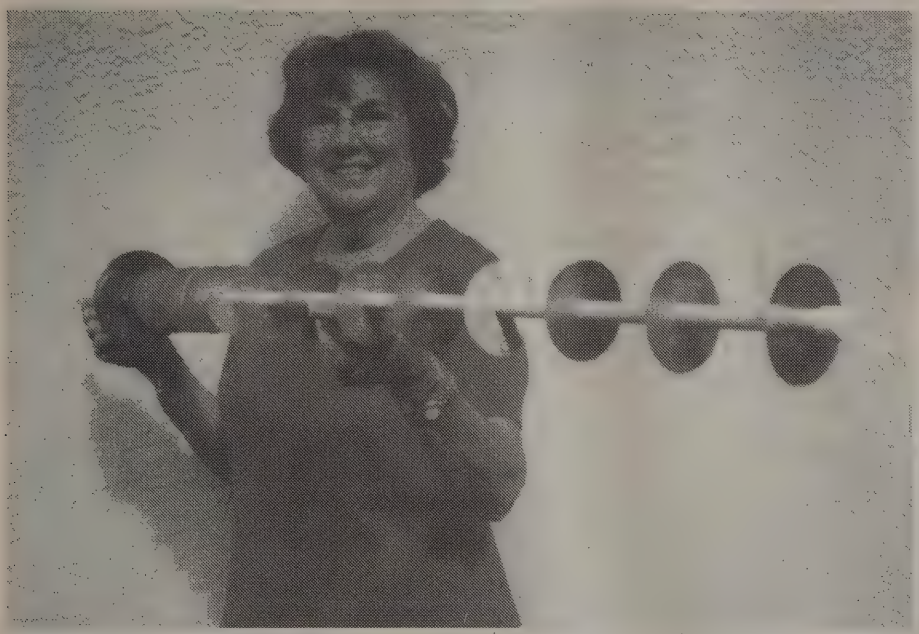
Email

My name is Bryan, KC8LMI, from Michigan (35miles south east of Lansing). I am active on 439.250, and 910.250 amateur television. Heard about the W9ATN repeater, and sounds like its quite a system. I do not have any equipment for 1200 MHz, so I would have to use the 434 input. I imagine on a good opening we would be able to work it. We are at 110 feet with two k1fo 33 element (25ft boom) yagis, mast mounted pre-amp, and a run of inch and five eights heliax. I can work Ron W9ZIH around p3 levels with slight enhancement. Just wondering at your convenience if you could bring up the repeater and we will try to work it from over this way. Will look forward to working one of these days. Bryan - KC8LMI

ATVQ

Two Minimal Cost Parasitic Beam Antennas

By Bill Parker - W8DMR - Email : w8dmratv@copper.net
2738 Floribunda drive
Columbus, OH 43209



N8LEP, Patty Parker, holding rod & disk antenna for 23 cm ATV usage.

Waste not, want not!

The first photo shows XYL, N8LEP holding an antenna made using the "pull-top" covers from empty, honey-roasted peanut containers. It's for the 23 em band (1250-1280 MHz.). The metal circular reflector element is next to her right hand and was made from scrap aluminum rain gutter stock.

The driven element is a resonant fullwave loop of brass stock, and is supported by the coaxial feedline itself. The spacers between all of the elements are pieces of 1/2 inch diameter plastic PVC water pipe.

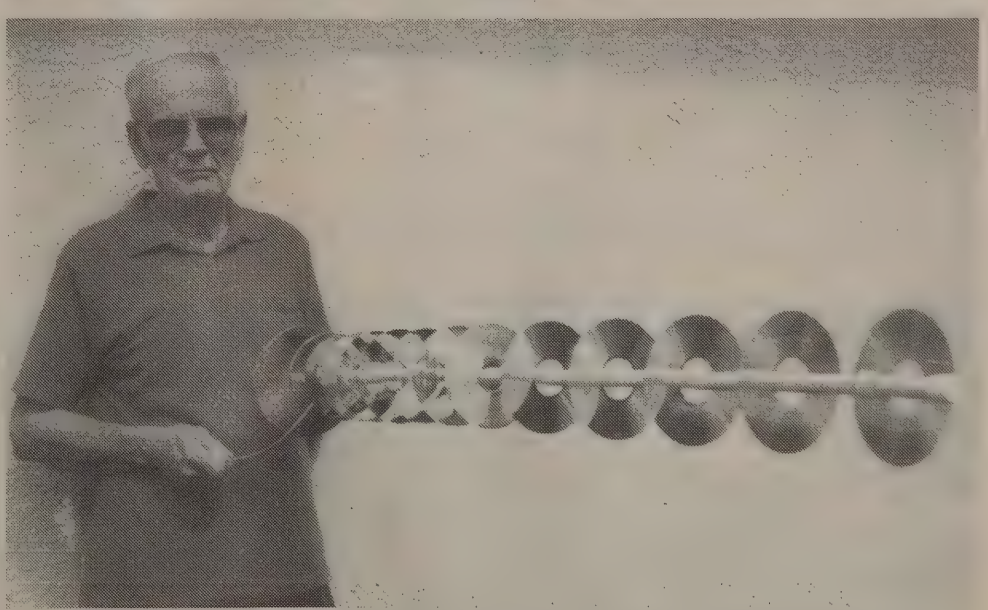
The internal support boom consists of a four foot length of wooden dowel rod. Two PVC end caps at each end secure all of the elements. This type of antenna is called a "Rod & Disk" configuration.

All of the aluminum pull-top covers were trimmed using scissors to a diameter of 3 1/8 inches. From the driven element, the first five launching directors are closer spaced than the remaining directors. They are spaced 3 5/8 inches. Element spacings are essentially the same as those employed in the ring type loop yagi antennas offered by DownEast Microwave.

The author is holding a similar rod & disk antenna, except the directors are made from obsolete (and free) CDs issued by CompuServe and AOL interact providers. The CDs require some additional diameter reduction. The antenna as shown has gain, acceptable VSWR and exhibits directivity. Too bad the peak resonance is not in the 33 cm band (910 MHz.) hi. Without reducing the diameter of the CDs an additional ~3/8 inch, the antenna radiation maximum was near 800-850 MHz.

Neither antenna's field is circularly polarized. It is linear polarization, and convention mounting determine whether it is vertical or horizontal polarization. Both photos show the antennas held for radiating in the horizontal plane.

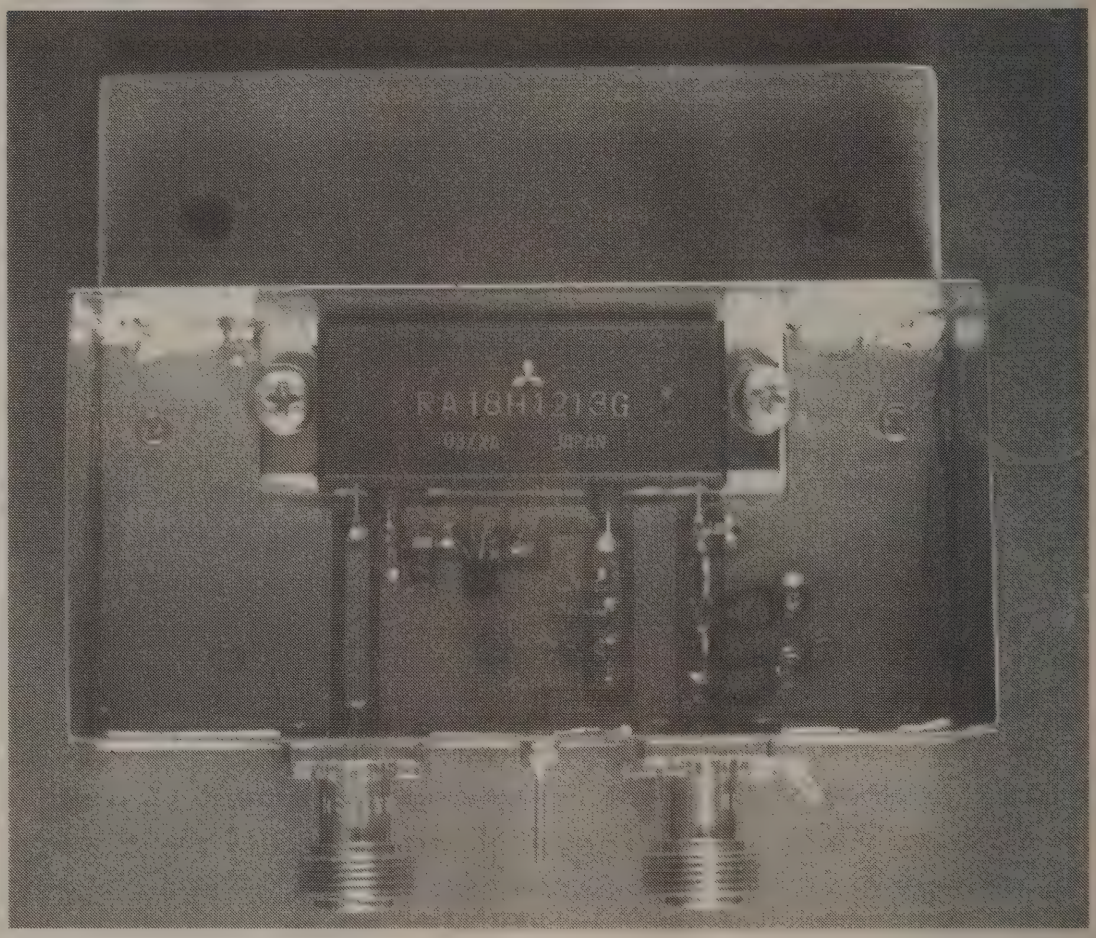
The driven element in each antenna utilizes the same construction technique used in the more conventional and proven fullwave ring type of loop yagis. The internal wooden boom diameter is 5/8 inch with 3/4 inch PVC for the spacers and end caps.



W8DMR, Bill Parker, holding rod & disk antenna for 33 cm ATV usage. Directors are discarded CD computer disks.

New MOS-Fet Hybrid Amplifier RA18H1213G

By Philipp Prinz - DL2AM
Translation By Klaus Kramer - DL4KCK



After nearly 20 years of bipolar hybrid technology now Mitsubishi is producing MOS-Fet modules for the range 60 MHz - 1.3 GHz, some of them being usable for amateur radio.

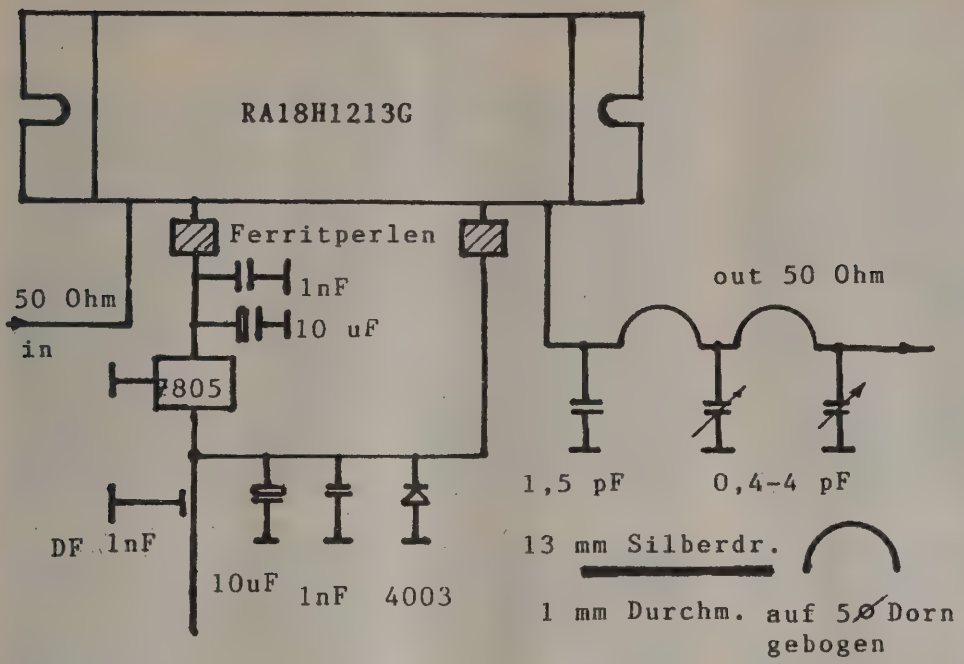
The rf output power is varying between 6 and 60 Watt. During my first try with the 23 cm hybrid I found a very high DC current drain, but also 4 dB more gain than with the bipolar forerunner. So the degree of efficiency has suffered a bit, the qiescent current is about 6.3 Ampere with 5 Volt bias.

Another finding is that there are only four leads now, and the 5 Volt bias only needs 1 mA because of the MOS technology. This 5 Volt bias can be made variable between 3 and 5.5 Volt, while 3 Volt means no output. Maximum gate voltage is 6 Volt, and DC supply voltage may not exceed 16 Volt. The plastic case is H2 like with the old M57762, and more copper surface means high temperature stability. Gain linearity is much better than before and is usable even for DATV.

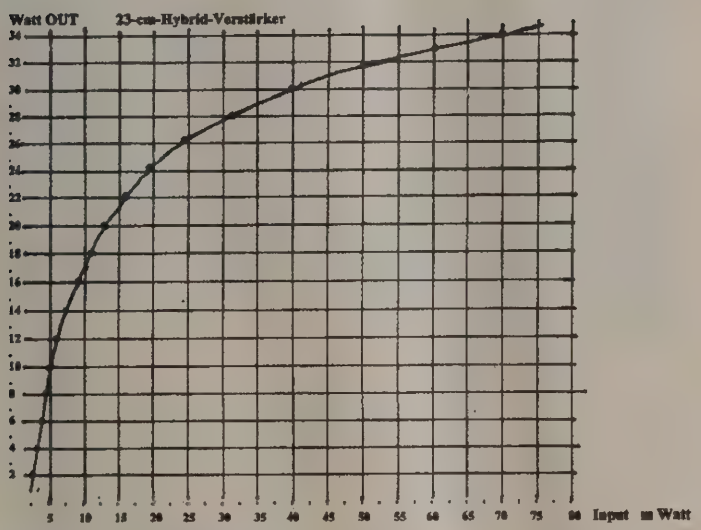
The carrier board is from FR 4 material, 1.5 mm thick with double-sided copper layer and easy to handle. The copper leads and the output band-pass filter can be made by using a small cutter.

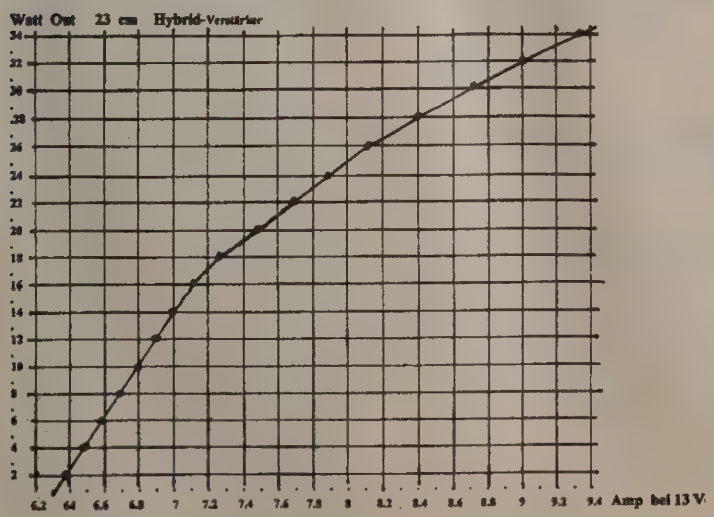
The tin plate housing should be soldered to the copper surface all around. A heat sink of minimum 120 mm length is optimal, and the hybrid`s ground plate should be clean and brushed with heat-conductive paste. Capacitor trimmers should not be turned too often because of gold abrasion causing loss of performance.

After completing the assembly you are advised to check for short-circuits and turn trimmers to middle position. A 50 Ohm load resistor of 40 W capacity should be attached to the output.



12-13,5 Volt Dc





Now you can feed 5 mW rf to the input and adjust output to maximum, with 13 Volt DC you can get 30 - 35 W having about 100 mW input. Overall heat dissipation will be around 80 W.

parts listing:
1 hybrid block RA18H1213G
1 tin plate housing 111x55x30 with top cover
1 PCB FR4 1.5 mm
1 heat sink min. 120 mm
2 N-type female connectors
2 ferro beads
1 voltage regulator uA78L05
1 diode SMD 1N4002 (or similar)
2 silver leads 13 mm with 1 mm wire size
2 trim capacitors 0.4 - 5 pF
1 cap. 1.5 pF SMD
2 cap. 1 nF SMD
2 cap. 16 uF/25 Volt Tantal
1 feed through cap. 1 nF
2 washers M4
2 screws M4 x 12
4 screws M3 x 8
4 screw nuts M3 x 6
5 screws M2 x 6

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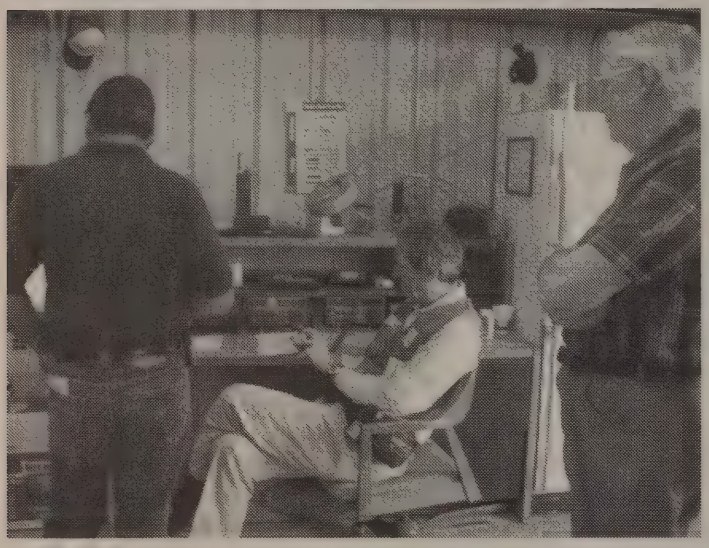


AATV "PIG FEAST"

The Arizona Amateurs on Television held their annual Pig Feast Dec 11 at the QTH of Norm (WV7K) and Connie (N7LTU) Sharpe in Glendale, Arizona. The Pig Barn comfortably held the 60 guest in attendance and there was plenty of food. The general drawing was highlighted with a DVD burner as grand prize, as well as a separate ladies drawing.

Live ATV demonstrations were available along with Frank (K2ATV) with his ATV mobile unit. The ATV auction capped off the event with the bidding being quite spirited at times.

Brian Vietri - WB7QDR - **sunsettelcom@juno.com**

ATVQ

ATV DX Records

I have started an ATV DX Record web site: **http://www.hamtv.com/atvdxrecord.html**
I often get asked the question of how far ATV can go or what the record is. Rather than point them to check past issues of ATVQ and Bob, KA9UVY's Midwest ATV DX Report and other articles and magazines, I thought it would be good to have it all on one web page with all the pertinent information. There are just a few to start right now and I hope the word will get out and I hear from those who have beaten the listings or have ones to add. The categories for now will be by ham band, overland, over water, rocket and balloon, AM or FM analog standard scan ATV. There is also a link to a USDS web site that has a good over the earth distance calculator if you enter the latitudes and longitudes of the two stations.

Tom W6ORG - P. C. Electronics - **www.hamtv.com**

ATVQ

The ISS & Slow Scan TV (SSTV) Imaging system

By G. Miles Mann, WF1F MAREXMG for the ARISS-International Team

There are currently two projects on board the International Space Station that will support Slow Scan TV (SSTV). These projects are called SuitSat and SpaceCam. The SuitSat project may be activated in December 2005 and SpaceCam in 2006 (all dates are subject to change without notice). The goal of this series of memos is to get the world ready to start decoding SSTV images from Space. If you want to get Ready for SuitSat and SpaceCam Slow Scan TV, then now is the time to start getting ready.

Receiving SuitSat:
The SuitSat Transmitter is preprogrammed to send a series of voice messages, telemetry and a single SSTV image, every 8:46. Then the whole process then repeats from the beginning. This means that each orbit over your house you will have one or two chances to receive and decode the image from SuitSat. You may also want to have your tape recording device handy to record the rest of the messages. The exact location of the image is approximately 6:42 seconds from the start of the first message.

ATVQ

Snow Pk. W6ATN Repeater

Here are a few pictures of the latest ATN repeater in southern California in the Palm Springs 29 Palms area. It has 50 watts on 1241.25 MHz VSB with inputs of 434 MHz AM and 2441.5 MHz FM. The six foot dish shown above is the link to Santiago Peak 41 miles away.

ATVQ

Dave KA6DPS

Note: ATN-CA chapter breakfast is Feb 18 - **see www.atv-tv.org.**

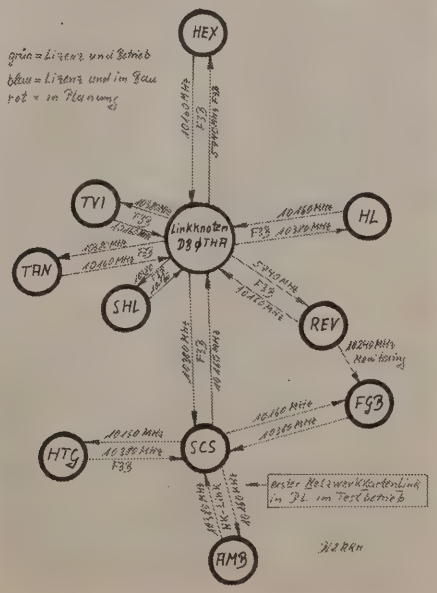
Latest News: ATV Repeater Hamburg Can Be Watched In Munich

The link network from northern to southern Germany will get digitized step by step: from Hamburg to Schneekopf Mountain with DVB-S (QPSK), from Nuremberg south-bound with 5 Mbit network controllers and streaming via VLC. Now we have managed to change the 140 km link from Schneekopf to Nuremberg to digital using D-Link network controllers 3.2 Mbit/s (8 MHz crystal), 10 GHz TX 200 mW by DB6NT and 60 cm parabolic dish with LNB. This is a nice alternative to the DVB-S equipment, and we are streaming the video with VLC (**www.videolan.org**).

NETIO Network Throughput Benchmark: packet size 4 Kbyte, Tx 363 KByte/s, Rx 351 KByte/s. Additionally Packet-Radio forwarding is using these links.

Stephan, DG7NDV Web link: **www.atvlink.de**

ATVQ



Name Tags by Gene

New from Harlan Technologies - beautiful, colorful, plastic name badges! Available with locking safety pin, magnetic bar, luggage strap, or lanyard.

These colorful badges can be made from our sample artwork, or if you like to be creative, you can make your own. Great to have a club badge with your club logo, or for proper identification with group such as ARES.

Prices

Badge with safety pin.....$10.00
Badge with magnetic bar $12.00
Badge with luggage strap $10.00
Badge with lanyard.....$10.00

You must see our many designs on our web page:
www.hampubs.com
Order your new name tag today!

Name Tags by Gene

Beautiful COLOR name tag / badges with photos, artwork, or plain colored backgrounds.

Design # from book _____ or
Background color _____ or
Picture file name _____

Picture insert #1 _____
Picture insert #2 _____
Picture insert #3 _____

TEXT
Line #1 _____
Line #2 _____
Line #3 _____
Line #4 _____
Line #5 _____
Line #6 _____

Name _____ Call _____
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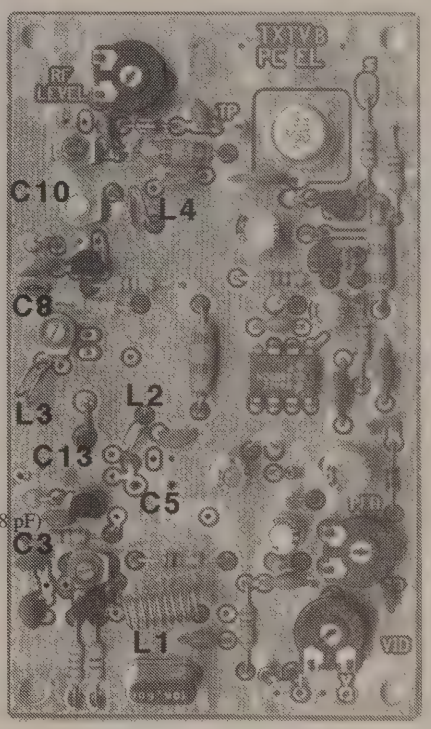
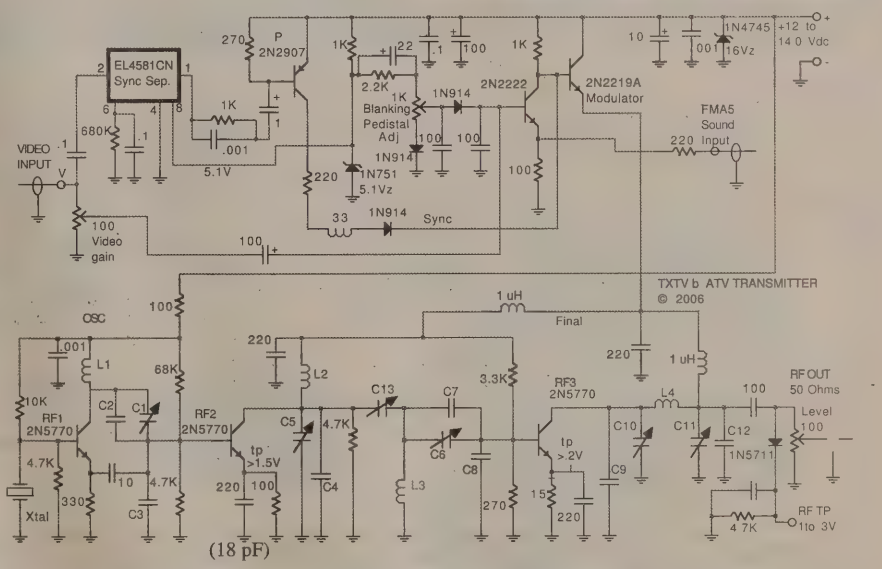
TXTVb - 70cm ATV Test Generator

A low cost ($30), low power 70cm ATV generator can have many uses in the shack and for demo's. The TXTVb board will put out 1 to 10 milliwatts with DC inputs of 8 to 14 Vdc @ 40 mA. For portable, it can run on a 9V alkaline battery for over 8 hours.



Any time you think your receive system isn't working or you want to do some fine tweaking, fire up the test generator and you have a solid crystal controlled signal - no need to have to wait until a local ATVer is around to send a picture your way. Put the board in a Hammond 1590C die cast aluminum box, run the DC through a feed thru cap, and bypass the video in jack with a 33 pF cap with short leads to prevent too much radiated RF from being stronger than what comes out of the RF jack. It would take about 60 dB attenuation to get down to P4-P5 levels with a direct connection to the receiver - tough to get inside the box with resistors. A low cost solution is putting a 50 Ohm resistor to ground with short leads directly on the RF Jack and playing with the placement of a short "gimmick" pick up wire on the center pin of the jack for the desired level. More practical would be to make a RG174 coax connection between the board and jack, then a good fixed or variable attenuator in the external coax line then you can use the generator full power for other uses.

Want to play with ATV antennas? Connect the 10 mW from the board directly to the RF jack. Put the test generator on top of your car with a ground plane or dipole, park it down the street at least 75 yards to make sure it is in the far field, and that you have line of sight with no other cars in between. Set up a TV on an extension cord at the curb and a connect a DC voltmeter to the AGC then tweak away or compare gain if you have a step attenuator you can put in the coax line so you can set for the same AGC voltage as with a reference antenna of known gain.



The board comes stuffed and soldered up to a point as it was originally designed to drive 144 MHz transverters for higher bands or export broadcast TV transmitters. Board plus kit is $30 - see Specials web page. Specify 70cm Test gen when ordering. Crystal $20 - Uses same crystal as in all our transmitters.

TXTVbTG Parts Kit includes: L1 = 8.5 turns #22 buss wound on a 10-24 screw as a form, L2,3,4 = 1.5 turns - space inductors 1/16" above the board ground plane. RF1, 2, 3 = 2N5770. C3 = 56 pF, C8 = 18 pF, C13 is removed and replaced with a 1 pF, 220 pF RF2 emitter bypass cap is replaced with an 18 pF. Remove C10 and replace with 2-8 pF variable cap.

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ATVQ TO PAY FOR ARTICLES! CONTRIBUTORS GUIDE

Payment for Technical Articles

ATVQ will pay for certain articles that it publishes. I will outline the policy here, but it will be subject to change as needed to make sure that ATVQ continues to be an ongoing publication. ATVQ will pay $25.00 for technical articles that are published and are a minimum of 2 pages. While this is not a great amount, I hope it will encourage more technical type articles to be written. Exceptions will be articles that are written by a manufacturer/seller of equipment that is being written about. While I do not want to discourage this type of article, the article itself is an advertisement of the product. Articles from clubs will be encouraged, and I would expect they would like to share their information with the ATVQ readership. Information gathered from the Internet will not be paid for and is mostly small filler items.

Ideas

Do you have an idea for an article that you've said to yourself that you wanted to write, but never did. Feel free to check with us to see if it is of interest, or write and send it in. No guarantees that it will get published, but if you don't try, you will never know. I'll be looking to see what you can do!

Preferred method of receiving articles is from **Microsoft Word**, however **Wordperfect** is OK too. Next preference would be **ASKII text**, followed by **typewritten** or **hand written** (clearly). Diagrams or pictures (B&W or Color) can be sent in hard copy, or if you scan them in, save to PCX or JPG formats (actually I can read about anything). If you send a computer disk, make sure it is PC (not MAC) format.

When sending in articles in Microsoft Word, please SAVE with FASTSAVE OFF and save in Word 6 format. Also, articles written in any word processor, consider what will happen when it is re-formatted to fit the style that I might put it in. An example would be setting up tables or adding figures into the article. They can be very hard to strip out. If possible, put the tables, figures, each in a file by itself. This will help me to be able to import into the magazine format.

Articles can be sent to:
ATVQ, 5931 Alma Dr., Rockford, IL 61108

or to our email address: **atvq@hampubs.com**
Also note our web page address: **http://www.hampubs.com**

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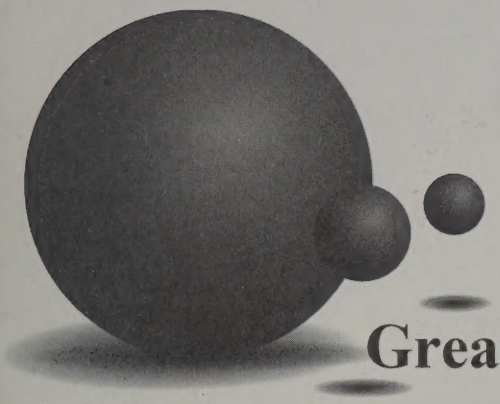
If you find a store willing to carry ATVQ on their shelves, we will extend your subscription by one year. In the case that two people turn in the same store, the first one wins! Offer subject to change at any time, but not likely to!



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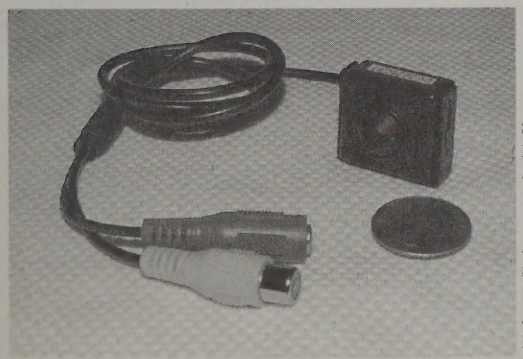

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